

# STEEL

*The Magazine of Metalworking and Metalproducing*

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## Inherent Quality

The close cooperation of management and men at Pittsburgh Steel makes possible the inherent quality in our products that serve you so well.



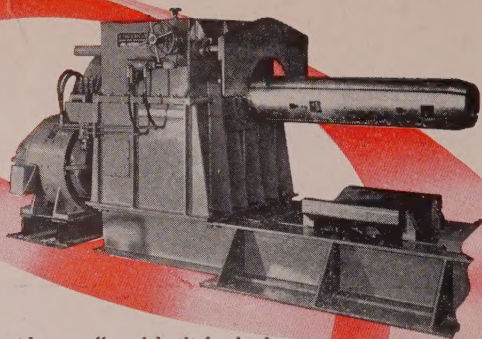
**Pittsburgh Steel Company**

Pittsburgh 30, Pa.

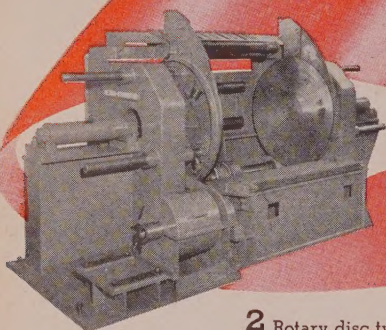


**4 WAYS TO CUT**

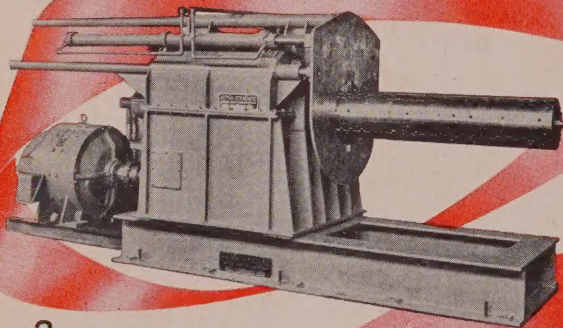
# *Coil Handling Time*



**1** 72" wide payoff reel built for high speed slitting line.



**2** Rotary disc type coil box with quick opening side guards.



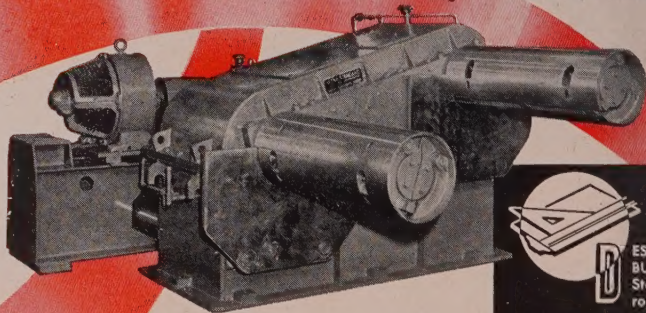
**3** This 72" wide tension reel, companion of payoff reel, one of the largest ever built . . . for handling 72" wide coils of 30,000 pounds.

(1) Photographs shown represent some typical Aetna-Standard Coil Handling Units. This 72" wide payoff reel provides back tension control at high speeds. Loading or expansion movement controlled hydraulically, and a patented feature centers coils automatically. Handles up to 30,000 pounds in weight.

(2) This rotary disc type coil box has motor driven carrier rolls, and air operated side guides. The guides quickly open to receive a new coil, and return to a pre-set width. For handling hot rolled coils with a minimum of damage to material, look at this Aetna product.

(3) Companion unit to the payoff reel . . . a 72" wide tension reel arranged for either under or over winding with positive hydraulic expansion. For rewinding multiple slit material at high speed, stripper operates by air.

(4) The double drum tight coiler for rewinding material from continuous lines has many features . . . (a) selected gear drive and air stripping; (b) two reels for operations where large investments in single reels are not practical; and (c) made for any width material.



**4** Double drum tight coiler for rewinding material from continuous lines.



**THE AETNA-STANDARD ENGINEERING COMPANY**


**YOUNGSTOWN, OHIO**

ASSOCIATED COMPANIES:

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## This Compact, New VEEDER-ROOT COUNTER

**Fits more easily into  
any product-design**

**T**rim and slim as a fine timepiece . . . and even easier to read . . . this new general-purpose Series 1260 is the most important news in counters since the Veeder-Root bicycle cyclometer of 1868!

This eye-catching counter, richly finished in 2-tone grey to set off the "Ease-Eye" direct-reading line of 6 bold figures, will measurably add to the *appearance* . . . to the *utility* . . . and to the *marketability* of any machine or product into which it is built as an integral part. It will deliver continuous *Facts in Figures* on any phase of operation or

production . . . and it will prove the product's guarantee.

And the new 1260 will fit into the closest design-limitations. For it measures only  $4\frac{1}{2}$ " long,  $1\frac{9}{16}$ " high,  $1\frac{1}{2}$ " wide . . . weighs only 12 ounces. Speeds from 1,000 to 5,000 counts per minute, depending on type of drive: ratchet, revolution, direct, or geared. Capacity is 1,000,000 counts. Then one turn of the knob resets to all zeros.

Look for this good-looking modern counter in the new machines and equipment you buy. And, by all means, look into its possibilities as a built-in *sales-builder* for your own products. Write.

**VEEDER-ROOT INC.**  
**Hartford 2, Connecticut**



# Behind the Scenes...

## We Are Complimented

One of the activities which has been carried along behind the scenes here for a long time is a census bureau. We've mentioned it here before, so many of you no doubt know that we try to keep tabs on all plants in the metalworking industry. We've been rather proud of the completeness and accuracy of the operation, but not until the other day were we aware that its reputation had grown. One of the things we have tried to keep track of is the operations performed by metalworking plants. Until recently, nobody else was checking up on that sort of thing, but the Census Bureau down in Washington thought it might be a good idea to include it in the 1947 Census of Manufactures. They did—and currently the results are being tabulated. We were really pleased the other day to hear that we had received a phone call from the Census Bureau. They wanted to find out how accurate their new operations figures were by checking them against ours, which we think is a real nice compliment.

## Fifty Years Ago

Fifty years ago this week the trade was astounded by the continued rise of iron and steel prices. Advances of \$2 per ton per 24 hour period have been common, and bidders are still pushing prices higher. It is expected that all-time highs will be made for nearly all products. The American Tin Plate Co. has withdrawn all quotations on tin plate and buyers are frantically searching for sources of material (and well they might, because American is now the only producer in the country!). In Chicago a firm to be known as Edgar T. Ward & Sons was formed, along with at least fifty other companies. Some twenty-odd steel and iron plants were sold to new owners during the week, and gossip about new combines and consolidations continue. Among our advertisers we find such names as Chicago Rawhide, Link-Belt, B. F. Sturtevant, Jones & Laughlin, and Joseph Dixon Crucible Co.

## Fundamental Material

To answer a lot of questions currently being asked of the editors, the Readers Service Department, and sundry other parts of our organization, we'd like to state that some future day will see the publication, in book form, of Fundamentals in Steel-making. This series at the moment is featuring an article on

tool steel production by George A. Roberts, Chief Metallurgist of Vanadium Alloys Steel Corp. Dr. Roberts' article holds to the high level established by the preceding articles in the series, and is worth while reading, whether your interest in tool steel production is direct or casual. But—and it's a big but—we don't want you to be holding your breath until we get the whole series published and then transpose it into book form. That's for the future—in 1951 or 1952. Meanwhile, however, we are going to make a copy or two of each section available to you in reprint form. We'll be glad to send yours along, too, if you'll write us.

## Puzzle Corner

So far, we have one answer to our foundry problem of two weeks ago. According to our little black book, the specific gravity of iron is 7.212 and of nickel is 8.907. That's supposed to help you figure out the answer—which H. C. Osborne of Racine, Wis. says is 26.67 pounds. Another old friend and regular puzzle answerer, D. A. Cotton, sends in this one: A train leaves A at a given time, travelling at 60 m.p.h. At the same time, another train leaves B, 100 miles from A, travelling at right angles to AB at the rate of 40 m.p.h. How far has each traveled when nearest each other? How far apart are they then?

## Thank You, All!

We are really a bit embarrassed this week. Since we sent out the first of our 205th Reader Certificates, we have been receiving some very nice letters, and right here and now in public we'd like to thank all of you who have written in to us: They're wonderful!

## Whodunit Dept.

The mystery of who is C. G. Harwin, who sent us the uncanceled postcard, has been solved. Mr. Harwin has stuck up his head to be counted, and proves that he's a coke man in Camden, N. J. This week we seem to have another one, in a letter addressed to Mr. Edward F. Schneider, Editor of STEEL. We don't know who Mr. Schneider is, but Irwin H. Such, whose office is over our head, claims to be the editor, and we've been believing him for some little time now!

*Shradu*

(Editorial Index—page 69)

# STEEL

Vol. 124—No. 10

March 7, 1949

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STEEL



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The Magazine of Metalworking and Metalproducing

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★ Denotes Regular Features.

## NEXT WEEK...

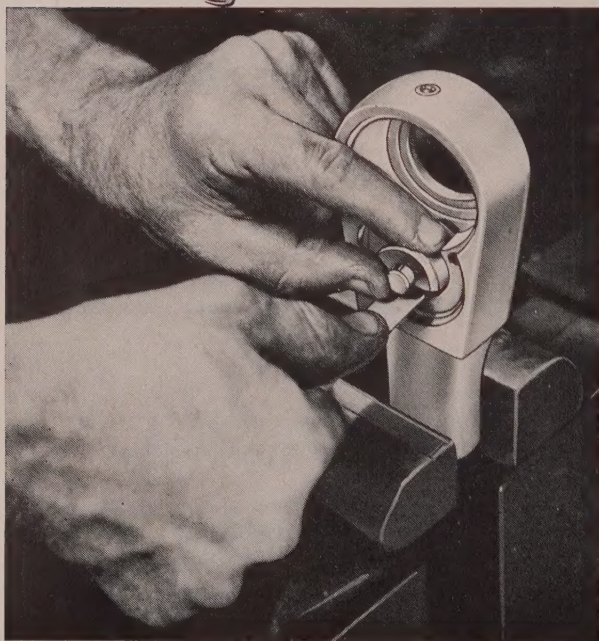
What Causes  
Localized Corrosion?  
Fast Setting of Diamonds in  
Wheel Dressing Tools  
How Steel Producers View  
Compositions, Specifications  
Statistical Quality Control  
Operation in Steel Mill



# Why Some Men STAY MARRIED TO WRENCHES



Improved performance and minimum bulk make these nickel alloy steel Snap-on ratchet wrenches favorites throughout industry.



**PAWL BEING ASSEMBLED IN RATCHET HEAD.** Use of nickel alloy steel and extraordinary care in machining these parts, assure free working action at all times.

All hand tools have to be able to take punishment, partly from their wide use by inexperienced operators and also because of the necessity of withstanding high unit stresses in normal services.

Take ratchet wrenches for example . . . they are usually operated under heavy pull. The working parts require good impact and fatigue properties and must nevertheless be made from a readily machinable steel. In view of the thin sections employed, the material must be relatively "foolproof" in heat treatment. Hence the frequent adoption of nickel alloy steels for wrench components.

In the ratchet wrenches shown above, designed and developed by SNAP-ON TOOLS CORPORATION, Kenosha, Wisc., nickel alloy steel Type 3250 provides not only essential toughness and strength . . . but also insures long-lasting, hard edges on ratchet gears and pawls.

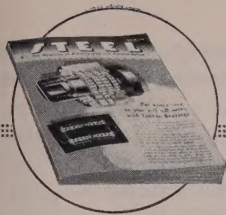
Both improved performance and ready response to fabrication are derived from nickel alloy steels. Write for our recommendations regarding the best types for your products or equipment.



Over the years, International Nickel has accumulated a fund of useful information on the properties, treatment, fabrication and performance of engineering alloy steels, stainless steels, cast irons, brasses, bronzes, nickel silver, cupronickel and other alloys containing nickel. This information is yours for the asking. Write for "List A" of available publications.

**THE INTERNATIONAL NICKEL COMPANY, INC.** 67 WALL STREET  
NEW YORK 5, N.Y.





March 7, 1949

## Today's Challenge

Opinion as to the meaning of the current spottiness in the nation's economy differs widely. Chesapeake & Ohio Railroad's Chairman Robert R. Young says flat-footedly that the country "already is in a depression." Most union leaders declare that unemployment is worse than indicated by official figures.

On the other hand, spokesmen for the administration in Washington are optimistic. They view the present softness as an adjustment which will be completed shortly and will be followed by good business. In many industries, salesmen in the field are more concerned about the outlook than are their sales managers in the home offices.

These conflicting opinions can be explained in part by environment. Government officials live in an atmosphere which calls for belief that inflation still is a serious threat. This colors their appraisals. Union chiefs thrive on complaints, hence unemployment spells opportunity for them. Salesmen reach conclusions from their day-to-day experiences; sales managers form opinions on the basis of averages from the reports of many salesmen.

In spite of the wide range of opinion between the extremes of optimism and pessimism, there is substantial agreement on one point. Most authorities agree that there still is a heavy demand for products "at the right price."

This generally accepted fact is a challenge to manufacturers. It means they must provide greater value at lower price. They can do this if they do not have to pay premium prices for steel, if labor is more productive and if they can achieve greater efficiency in most of their operations. The opportunities in these directions are great.

However, there is another opportunity. Almost everything that has been brought out since the war ended has been dramatized as "de luxe." For instance, the 1949 Chevrolet is a far better buy than the 1929 Buick. Almost every 1948 or 1949 model of anything has expensive "de luxe" features.

It is time that manufacturers realize that many consumers want real values rather than "show-off" stuff. Where is the 1949 counterpart of the 1929 Chevrolet or the Model T Ford?

Opportunity is knocking at the door of the manufacturer who will sell a practical, presentable, reliable product without fancy doo-dads at a realistic price.

\* \* \*

**IT IS DEFLATION NOW:** Repercussions of the easing of demand for many products are being felt in ever widening circles. The action of General Motors in reducing wages and the prices of some models simultaneously has been followed by other significant moves in motordom. John S. Bugas, vice president-industrial relations, of Ford, has cautioned Walter Reuther, president of United Auto Workers-CIO, that the problem now facing the company is one of sales and steady jobs and that any further advance in wages would place Ford out

of line competitively. Meantime, a cutback in production schedules by Hudson Motor Car Co. is the fourth to occur in the automotive industry in recent weeks.

That the implications of the economic situation are beginning to be considered in Washington was evidenced by the action of the Federal Reserve Board last Wednesday evening in easing credit restrictions. Inasmuch as the restrictions were inaugurated to combat inflation, this act of easing them must be construed as a sign that Washington now recognizes that in-

(OVER)



# AS THE EDITOR VIEWS THE NEWS

flation is not as much of a threat as it was a few months ago.

If this is true, then it would be consistent for the President to alter his views about taxes, controls and social security, all of which were proposed under the claim that they were needed to curb inflation. Certainly present conditions call for a thorough revision of most of the President's legislative program.

—pp. 77, 78, 80, 91, 167

\* \* \*

**PROBLEMS OF SECURITY:** Edward V. Hickey, director of production, National Security Resources Board, says military expenditures are running at approximately \$1 billion a month and that in the placement of orders "small business" is not being overlooked.

Apparently dispersal of plant is an important factor in the board's plans. It is recognized that small manufacturing facilities, already dispersed in widely separated areas, "would be in a position to bridge a production gap in event of wholesale destruction of large factories in congested areas."

The board's experts have determined that space between key installations is the best protection against attack by atomic weapons. They urge that essential units be separated by at least three miles and that, where feasible, new plants be constructed in communities of 50,000 or fewer persons.

NSRB also is giving major attention to raw material problems and to the adequacy of electric power and natural and manufactured gas.

—p. 82

\* \* \*

**PROPOSE MORATORIUM:** Latest development in the steel pricing situation is approval by the House Judiciary Committee of a bill which would provide a 16-month moratorium on new antitrust actions under the Federal Trade Commission Act or the Clayton Act against freight absorption in pricing made in good faith by individual sellers. The purpose of the bill is to give the Supreme Court time to clarify the meaning of its cement case decision through a ruling it is expected to make in the rigid steel conduit case.

If this bill should be enacted and if the Supreme Court's decision in the conduit case should fail to clarify the present confusion caused by the cement case decision, then Congress would have until July 1, 1950, to act on clarifying legislation. In view of the extensive hearings already held on the subject, it is doubtful whether further investigation would

bring out any new pertinent evidence. Prompt clarification, either by court ruling or legislation, would be preferable to additional delay under any pretext.

—p. 81

\* \* \*

**BIG GROWTH SINCE '39:** Bureau of the Census of the Department of Commerce has begun to release preliminary figures on its Census of Manufactures for 1947. This is the first census of this kind compiled by the bureau since 1939.

Among the industries for which 1947 figures now are available are primary aluminum, domestic laundry equipment, electrical appliances, screw machine products, storage batteries, vacuum cleaners and x-ray and therapeutic apparatus. Comparison of 1947 figures with those for 1939 shows that in all of these industries the numbers of plants and of employees, the amounts paid in salaries and wages, value added by manufacture, cost of materials and value of products shipped increased by impressive percentages during the eight-year period.

When data for all of the groups comprising the metalworking industries are available, we will have a reliable and much needed measure of growth since prewar times.

—p. 89

\* \* \*

**SAVINGS OF \$5 PER TON:** A steel foundry in eastern Pennsylvania has found by experience that modern materials handling systems and equipment can result in substantial dollar economies and in other important advantages. In the words of the foundry company's president, "We are now running a jobbing business on a production basis. We have borrowed the materials handling thinking of the mass industries—added a few ingenuities of our own—and applied it to our operations."

Before the present practices were adopted, all castings were handled by cranes. After a thorough study, it was decided large and small castings should be handled separately to overcome the lag between production and shipment from the cleaning and finishing departments. Now castings over 50 pounds are handled by crane and those under 50 pounds are handled by electric fork trucks. The over-all savings in costs, due to handling the two classes of castings separately, has amounted to from \$5 to \$7 per ton.

—p. 112

*E. L. Shaner*

EDITOR-IN-CHIEF



**EASIER CREDIT TERMS**—Relaxation last week of government controls on consumer installment buying is viewed as admission by the administration inflation is no longer a threat to the economy. Among those who should benefit from the easing in credit restrictions are appliance makers (p. 77), who had cut production back sharply into line with current sales rather than become burdened with big inventories of merchandise produced at current high costs. Further evidence of slackening in business and industry appeared last week but the downturn still is looked upon as an orderly adjustment from post-war peaks (p. 78). Indicating strength still prevails in the industrial picture, STEEL's industrial production index rose a point last week over that of the preceding week (p. 96). With a return of the buyers' market in the U. S., Europe foresees a slackening here in a demand for its products (p. 87.)

**AIDS SMALL BUSINESS**— In developing its program for quick expansion and conversion of industry in event of all-out mobilization for war, the National Security Resources Board has a fixed policy of adequate attention to production potentialities of small business (p. 82). Also the board is taking positive steps to encourage fair participation of small enterprises in current production of military requirements, now running at \$1 billion a month.

**WAGES**—Steel industry men fear union request for redetermination of minimum wages paid in steel plants for work on government contracts is a subtle effort to force the general wage structure upward (p. 79). Hearings on the union's request have been concluded but a ruling by the secretary of labor is unlikely before a month.

**ANTI-TRUST MORATORIUM**— To give the U. S. Supreme Court time to clarify its cement case decision through a ruling in the rigid steel conduit case, the House Judiciary Committee has approved a bill providing a 16-month moratorium on new anti-trust actions against freight absorption in good faith in pricing policies of individual sellers (p. 81). In event the court fails to make the clarification, the bill would give Congress opportunity to study the pricing situation further.

**ALLOCATIONS CUT BACK**—Continued adjustments into line with needs may further reduce the steel tonnages moving under voluntary allocations. Already, cutbacks in allocated tonnages have effected a saving of around 139,000 tons a month (p. 81). Allocations programs are currently taking around 560,000 tons monthly, about 10 per cent of total monthly output of finished steel.

**SHIP CAPITAL GOODS**—Latest Economic Cooperation Administration authorizations indicate the emphasis on aid to Europe will be on capital goods (p. 84) this year. In the past it has been on food, clothing and living essentials. Heavy goods shipments will be further expedited in 1949 if appropriations measures now before Congress are approved.

**HERE AND THERE IN INDUSTRY**—General Electric Co. last week shipped the first J-47 jet engine from its new Lockland, O., plant, less than five months after operations began (p. 83) . . . A Chilean steel plant is to be fully integrated (p. 88) and of the \$83 million cost \$60 million will be spent in the U. S. for equipment, materials and services . . . By end of 1949 a \$400 million construction program will have increased Bethlehem Steel Co.'s ingot capacity 30 per cent over 1939 (p. 94) . . . National Supply Co., Pittsburgh, will spend \$6 million (p. 94) to complete an improvement program which already has cost over \$17½ million . . . Although ice may not be a hindrance this year to early navigation by Great Lakes ore vessels they will not sail (p. 89) until Apr. 5 because insurance rates are prohibitively high until then . . . Huge deposits of manganese, with ore assaying as high as 58 per cent pure metal, have been discovered (p. 88) in northern Brazil . . . Continuous casting of electric steel may be placed on a commercial basis by July (p. 83) . . . Pig iron output rose to a new all-time high of 5,662,024 tons in January (p. 81).



# Inland,

# too, Blends Ingredients ...for Steel to Fit Your Needs



**J**ust as the judicious chef blends his sauce to suit the individual tastes of his patrons . . . Inland prepares steel to meet the specific requirements of its customers. Being an independent and completely integrated company, Inland is in a position to render this service . . . to furnish *job-fitted* steel for your needs . . . and to act quickly when fast action is necessary. What's more, at Inland, your orders for steel—as well as your steel

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Their Personal Attention



METALLURGY SALES OPERATIONS

STEEL



# Easier Credit May Aid Appliances

**Less stringent government credit curbs, latent demand and low-inventory position seen as favorable factors for industry now experiencing a recession**

THE APPLIANCE industry, object of much attention because of the recession it has experienced, has two things in its favor—relatively small inventories and substantial potential demand that remains to be transformed into sales.

Some of this latent demand may become active immediately as a result of relaxation last week in Federal Reserve Board installment buying restrictions. Down payments on refrigerators, stoves, radios and similar goods are lowered from 20 per cent of the purchase price to 15 per cent, and installments can now be spread over 21 months instead of 15.

When sales began shrinking late in 1948, appliance makers quickly reduced their output rather than build up huge inventories at current high costs of materials and production. Consequently, if the relaxation of consumer credit controls does not prove to be a stimulus, further business declines will not find appliance makers burdened by big stocks of finished goods.

**Stocks Held Down** — Discussing stocks, a refrigerator manufacturer said inventories of its own warehouses and distributors are less than at this season in 1941. Likewise its retailers, although some have heavy stocks, average less inventory per

outlet than during 1940 and 1941.

**No Backing Up**—Production cuts in most fields came almost as soon as supply pipelines became filled, giving little opportunity for merchandise to back up substantially in warehouses. Manufacturers calculated it was about time for prices to come down. Consequently, where necessary they curtailed production in line with current sales.

An example of such action is that taken last week by Westinghouse Electric Corp. At its Appliance Division plant at Mansfield, O., it reduced its rate of output of small appliances, electric ranges and electric refrigerators for March. The production cut on 12 different small appliances varies from 10 to 25 per cent; on ranges, 10 per cent. Refrigerator production was cut from a six-day operation to five days.

March employment is expected to average 7200, compared with 7700 in February, 7800 in January, and a prewar figure of 5100.

**Outlook Held Good**—Outlook for appliance business in 1949 is good, according to Westinghouse. Similarly, General Electric Co. is confident it will equal its 1948 output of 12 million appliances this year. One washing machine producer looks for its 1949 business to be from 60 to 70 per cent

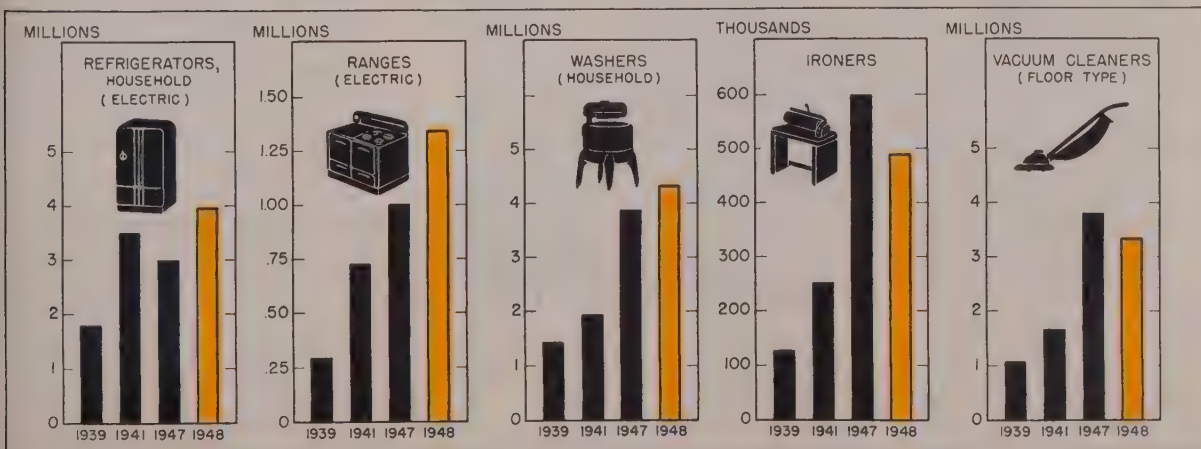
of last year's, while a maker of washers and ironers thinks its output this year will be 80 per cent of that of 1948. Even if appliance output in 1949 were only half that of 1948, it would be above that of 1939 and compare very favorably with 1941, as may be seen from the chart below.

Currently, some appliance makers are operating at only 50 per cent of capacity, while others are around 75 per cent. However, a washer producer said new orders have increased steadily since mid-January, and a washer and ironer manufacturer reported its new orders are holding steady. In some instances, surplus plant capacity is being utilized for contract fabrication work. On the other hand, a refrigerator maker is still operating at its post-war peak rate and using two shifts of 40 hours each. That company is engaged in a planned build-up of some factory inventory as well as shipping to distributors and retailers.

**Reducing Prices**—To lure business, appliance makers are resorting to price reductions, development of lower-price models, and intensive promotional and sales efforts. Because of high materials and labor costs, price decreases on present lines cannot go far. The alternative, H. L. Andrews, vice president in charge of General Electric's appliance and merchandising division, points out, is to produce simplified and less costly versions that will do the same work as higher-priced appliances.

In trimming costs, appliance makers are moving away from high-price steel, such as that obtained from warehouses and conversion ar-

## POSTWAR DEMAND PUSHES APPLIANCE PRODUCTION TO HIGH LEVEL





rangements, and placing increasing dependence on material obtained at mill prices. No large inventories of steel have been accumulated, for those whose production does not require all incoming material have been adjusting their steel purchases downward. As a whole, components are in easy supply.

## Business Slackening

**Adjustment from postwar peaks seen in production cutbacks and fading premium prices**

FURTHER signs of slackening in business and industry have developed during the past week but the downturn in activity still appears an orderly adjustment from postwar peaks, though here and there at a somewhat quickened rate.

More cutbacks in production and employment have been reported. Some manufacturing plants have gone from a five to a four-day week. Premium prices appear definitely on the run in some heretofore scarce products, including steel.

**Premium Prices Fading**—In steel, the gray market is but a shadow of its former self. Sharply reduced prices have failed to stimulate buyer interest. Increasingly, steel consumers are placing less dependence on conversion tonnage. Premium prices are under growing pressure as competition intensifies.

Last week Granite City Steel Co. cut its price \$10 per ton on cold-rolled sheets to \$84 f.o.b. Granite City, Ill., making it competitive with \$80 f.o.b. Chicago district mills, on tonnage shipped from that point into Granite City's home market.

Other significant reductions have been made over recent weeks, chiefly in the premium market (STEEL, Feb. 28, p. 48). Additional producers are expected to take similar action as competition intensifies, but downward adjustments are likely to be confined to the premium-priced tonnage, at least for the present. To date the so-called regular market has continued to display strength.

## Conversion Business Slows Up

SIGNS are increasing of contracting demand for conversion steel. Consumers are showing growing reluctance to purchase additional tonnage and as supplies become freer in the general market it is expected conversion activities will slow down progressively.

Indicative of the situation is the report that operation of an open-hearth furnace at the plant of the United Engineering & Foundry Co. in



**PACKAGED TROUBLE:** This packaged-product test conducted by Porcelain Enamel Institute's Packaging & Shipping Committee at Westinghouse Electric Corp.'s Mansfield, O., plant helped formulate the committee's recommendation for pre-shipment testing of packaged products under 100 pounds. Earlier, recommendations were developed for shipments exceeding 100 pounds in a program for reduction of in-transit damage to finished appliances and allied metal products

New Castle, Pa., has been suspended for an indefinite period. Output of this furnace, 4500 tons of ingots monthly, was for the account of the Westinghouse Electric Corp. About a week ago the furnace closed for repairs, which were expected to take about ten days. Now, it is learned, resumption is dependent on the outcome of an analysis by Westinghouse with respect to the outlook for steel demand and supply.

## PA's See Industrial Plateau

FORCE behind the decline in industrial activity, which began in November and continued through February, is diminishing and business may level off and maintain the present lower rate for a few months, National Association of Purchasing Agents reports.

Production, commodity prices, inventories and employment all are reported at lower levels in February. Back-order schedules, however, showed significant indication of increasing commitments during the month. Consensus among purchasing agents is that the leveling-off has been moderate and orderly; no panicky situations have developed. A buyers' market is evident in most commodities except steel and metals, and they may be softening.

For the third consecutive month, over 40 per cent of the NAPA mem-

bers surveyed report a reduction in purchased inventories. Forward commitment coverage continues in the "hand-to-mouth to 90 days" category, with 97 per cent reporting within that range.

## Sees No Slack in Building

TIDE of increasing labor and material costs in the construction industry since the war's end has turned downward, Guy C. Kiddoo, vice president, First National Bank of Chicago, told the Associated General Contractors of America meeting in New York.

With the tremendous volume of construction in highways, housing, public works and institutional building which this country will need in the years ahead there will be work enough to keep all contractors reasonably busy, Mr. Kiddoo said. "The contracting business is very largely depression-proof."

## Expects Early Balance in Steel

IT IS clearly apparent that the time is approaching when supply of steel will equal demand, in the opinion of Henry A. Roemer, president, Sharon Steel Corp., Sharon, Pa.

"If the steel industry can sustain its present operating rate without serious interruption in 1949, we believe the existing capacities plus ad-



ditions to be made this year will meet all requirements. Cost of new equipment, time required to install it plus the great amount of steel required would make it appear that any extensive expansion at this time would be unwise," he added.

Sharon's policy of acquiring subsidiaries and its modernization, improvement and expansion program are responsible for the firm's good earnings showing of a net profit of \$9,234,983 in 1948 as compared with \$6,722,019 in 1947. Mr. Roemer pointed out. More than \$22 million dollars have been expended by the company in its expansion and improvement program, with an additional \$4 million to be spent for completion of the program in 1949.

## Ford Points to Sales Problem

POINTING out that wages had advanced 42.5 cents an hour since V-J Day, John S. Bugas, vice president-industrial relations, Ford Motor Co., in a letter to Walter Reuther, president of the UAW-CIO, and to 106,000 hourly-rated employees, cautioned that the problem now facing the company is one of sales and steady jobs, and any further advance in wages would place Ford out of line competitively.

He said the 2-cent hourly reduction in wages effected by General Motors had put Ford under an additional wage handicap of \$5 million annually. On the matter of old-age security plans, he observed that there is no "kitty" from which the company can draw to pay for such programs. Looking to forthcoming negotiations with the UAW-CIO on a new contract, he declared "it is essential we go into negotiations with a real understanding of the problems involved."

## Hudson Motor Cuts Production

HUDSON Motor Car Co. has instituted a 17.6 per cent cut in production schedules, bringing car output down to 800 daily from the 972-daily rate prevailing since last fall. This has necessitated the layoff of 4500 of the company's 27,000 employees.

Hudson reported retail sales currently are running 55 per cent ahead of a year ago and warrant a daily schedule of 800 cars. Observers are of the opinion large field stocks may have prompted the reduction in assemblies to the level of sales in the belief that accelerated buying in the next few months will work this off.

The cutback by Hudson is the fourth in the automotive industry, the others being Kaiser-Frazer, Willys-Overland and Lincoln.

# Steel Wage Decision Deferred

**Redetermination of minimum wage on government work under Walsh-Healey act unlikely for month. Steel men see threat to established wage structure**

DECISION on the request of the United Steelworkers of America, CIO, for redetermination of minimum wages paid in steel plants for work on government contracts under the Walsh-Healey act may be some time distant. Hearings were concluded Feb. 25 by the Labor Department panel but it is believed a ruling by the secretary of labor is unlikely before a month at earliest.

In this connection it was pointed out by spokesmen for the steel industry that no new determination of the wage minimums under the Walsh-Healey act is necessary now in view of the fact Congress may act on minimum wages along much broader lines in the near future.

It was emphasized Congress is likely to act favorably on a bill raising general minimum wages to at least 75 cents per hour, so that the ground has been prepared for a much more sweeping action on wage minimums than the redetermination proposed by the union under the Walsh-Healey act.

**See Side-Door Move**—Statements at the Labor Department hearing indicated some steel industry representatives fear the union's application for a new Walsh-Healey minimum wage determination at this time is something of a side-door action aimed at obtaining a wage advance in violation of union contracts with the respective companies. An increase in minimums on certain

work, it was argued, might have a tendency to force upward the general wage structure.

The union's request for a redetermination of prevailing minimum wages in the various districts would provide for a minimum of \$1.23 per hour for common labor in plants outside the South, where the union asked for \$1.08½ cents per hour. Present minimums, established in 1939, range from 45 cents to 62½ cents per hour.

**Now Being Paid**—Union spokesmen pointed out that the majority of employers outside the South have been paying the \$1.23 minimum, though most union contracts with the companies specify a minimum wage of only \$1.18½ cents, except in the South where \$1.04 prevails.

Otis Brubaker, director of research for the union, denied his organization sought to set a general minimum of \$1.23 per hour, pointing out that under the union proposal the \$1.18½ cent rate would become a subminimum over a large part of the country, applying to certain job classifications.

Uneasiness of steel company representatives with respect to the proposal seemed to arise from the possibility the secretary of labor might ignore this floor rate entirely, and redetermine the minimum rate at the higher \$1.23 figure. In any case, the \$1.18½ rate would merely cover certain exceptions, leaving the gen-



**TAKING FORM:** Under construction at the Lorain, O., yard of American Ship Building Co., Cleveland, for Inland Steel Co., Chicago, is the Wilfred Sykes, to be the largest and fastest ore carrier on the Great Lakes. Completion is expected in 1950. NEA photo



eral effect of such action, a raise to \$1.23 as a minimum except in the South.

**Job Classifications Involved**—The union's request was based upon a classification, by job content, of a considerable number of the various jobs in the industry. Rates are based on such classifications. Although union spokesmen said they were not attempting to modify the Co-operative Wage Study job classification system in any fashion through the medium of the Walsh-Healey determination, steel company representatives insisted there was a much wider list of job classifications involved in the matter than listed by the union.

Speaking for the union, Mr. Brubaker maintained most plants in the basic iron and steel industry are covered by the classifications of the job study. These classifications, he said, are used in plants employing 458,574, or more than 80 per cent of total known employment in the industry as defined for Walsh-Healey act purposes.

Under this classification system the minimum plant or occupation rate, and jobs at such rate, are termed 0-1 or 1, covering such work as janitor, sweeper, etc. It is steel industry contention that many companies have up to 50 or 60 job classifications in this range, whereas the union listed a much smaller number.

The union introduced a new factor into the situation in requesting that certain additional industries be listed under the proposed determination. These were omitted from the original application. Among these are tin plate,terne plate, and tin mill black plate; railroad axles and wheels; rods; coated, clad or insulated steel wire; chain link fencing.

In the case of tin plate,terne plate and related products, the union pointed out that at the time of the original minimum wage determination, in 1939, employment included women who were generally paid at rates below the general minimum in iron and steel plants. Today, the union insists, all companies having any capacity for making such products are sizable steel companies, with one exception, all being integrated producers. Also, it was maintained, with two exceptions, all companies have rate scales in their tin mills equal to, or higher than the minimum now requested.

Importance of the minimum wage action under the Walsh-Healey act is seen in the fact virtually every steel company now is engaged in one way or another on government work which would be governed by the secretary of labor's wage determina-

tion. A list, made part of the record of the wage hearing, showed nearly 200 contracts, involving multiple orders to some companies, were placed with the steel producers in the period July-October, 1948, alone.

## State Labor Powers Upheld

FEDERAL labor laws do not prohibit state labor boards from enjoining certain work stoppages in firms engaged in interstate commerce, the U. S. Supreme Court ruled last week. When a work stoppage in such a firm is to attain ends which are specifically legalized by federal statutes, the state boards can act, the Court ruled.

Its ruling was made in a case concerning the Wisconsin Labor Relations Board, which had barred a local of the United Automobile Workers of America, AFL, from engaging in periodic work stoppages to enforce their bargaining demands on Briggs & Stratton Corp., Milwaukee.

The union had claimed its activity was guaranteed by the Wagner act and that the state board lacked the authority to interfere since the company was engaged in interstate commerce. The majority opinion of the Supreme Court held that recurring or intermittent unannounced stoppages to win unstated ends was neither forbidden by federal statute nor were they legalized and approved thereby. Such being the case, the state police power was not superseded by congressional act, and there was found no basis for denying the state the power in governing her internal affairs.

## Pipe Export Approved

**Trans-Arabian project held not likely to result in further drain on domestic supplies**

APPROVAL of an export license for 25,000 tons of 30-in. steel pipe for the Trans-Arabian pipeline, announced a week ago by Commerce Secretary Sawyer, is the first export license for this purpose since last April, when licensing was suspended because of disturbed conditions in the Middle East.

Latest action brings total tonnage authorized for this pipeline to 79,000 tons. However, it will require 260,000 tons for completion. Commerce Secretary Sawyer said the 25,000 tons licensed are for first quarter only, but while the Commerce Department is not committed to any further authorizations, it is to be presumed additional allotments will be permitted.

In this connection he pointed out that the 25,000 tons authorized for first quarter already have been produced and are in storage in California. Use by domestic pipelines is said not to be feasible. Consequently, he said the authorization does not mean any further drain on domestic pipe supplies and this is especially true since the mill heretofore engaged in producing for this project, beginning Mar. 1, will produce entirely for domestic account.

During the period export licensing for the Trans-Arabian project was suspended, the Trans-Arabian Pipeline Co. released for domestic use



**MOBILE COKE LAB:** A \$20,000 mobile laboratory, sponsored by American Iron & Steel Institute, is testing coke at various steel plants in order to improve quality. Tests at each facility last about two weeks. Laboratory was designed by Fuel Research Inc., Indianapolis. Indianapolis News photo



about 65,000 tons of pipe which had been produced for its account, and it has agreed to release additional amounts over the next few months.

Under its agreement with the government the Trans-Arabian company will transport for the Military Establishment, at cost, substantial quantities of oil from the Persian Gulf to the Mediterranean, for a period of ten years after completion of the pipeline.

## Allocations Adjusted

**Voluntary programs, now taking 10 per cent of steel output, subject to revision**

APPROXIMATELY 10 per cent of total monthly production of finished steel is scheduled to move under voluntary allocation over the next seven months, but the drain on supply for the regular market may tend to diminish as the months pass and needs of the various programs are adjusted to actual requirements. Currently allocation programs are taking around 560,000 tons monthly.

Office of Industry Cooperation has reviewed all existing voluntary plans and has adjusted some downward. Several proposed programs have been dropped. The prefabricated house program, which had been scheduled to receive 9835 tons monthly has been rejected. In all, it is understood, cutbacks in allocated tonnage have effected a saving of something like 139,000 tons monthly.

**No Overall Changes**—No changes have been made in overall programs that have been approved, but OIC indicates temporary adjustments will continue to be made, up or down, from time to time, depending on conditions at the time plans are reviewed.

Latest additions to the approved allocations list will add substantially to the burden on the steel mills, but shipments on these programs are not scheduled immediately. All three additions must still win final approval after public hearings. Proposals to earmark 161,870 tons for Economic Cooperation Administration requirements and 83,618 tons for Bureau of Reclamation projects will be discussed at public hearings Mar. 11.

Under the ECA program approximately 32,347 tons will be provided monthly, May through September. Most of this tonnage will be in the form of plates to be used chiefly for shipbuilding and repairs in the Scandinavian countries.

While voluntary allocations for warm air heating equipment will be

continued, this program has been cut back from 31,625 tons monthly to 26,400 tons, and will be effective only April through June. There will be no allocation on this program during March.

The proposed voluntary plan to provide 950 tons monthly for the manufacture of baseboard radiation will run April through June. This one had previously been rejected.

Department of Interior reclamation projects allocation calls for a total of 83,618 tons, beginning in May and extending through September.

## Pig Iron Output Sets Record

PIG IRON production increased to a new all-time high in January to 5,662,024 tons, exceeding the previous high, in peace or war, of 5,525,282 tons established in December of last year, according to the American Iron & Steel Institute.

Including ferromanganese and spiegeleisen, output of which totaled 62,815 tons, January production was 5,724,839 tons.

Blast furnace operations in January declined to 95.5 per cent of capacity.

Distribution of production by districts during January was as follows:

	Pig Iron	Ferromanganese and Spiegel	Per Cent of Capacity
Eastern .....	1,103,952	34,502	100.3
Pittsburgh-Youngstown .....	2,131,438	20,753	95.1
Cleveland-Detroit .....	589,100	.....	99.3
Chicago .....	1,180,036	.....	88.7
Southern .....	425,061	7,560	101.6
Western .....	232,437	.....	93.9
Total .....	5,662,024	62,815	95.5

Production of alloy steel ingots and steel for castings increased to 787,298 tons in January from 741,433 tons in December. Open-hearth output accounted for 598,595 tons of this total in January while electric and crucible furnace output was 188,703 tons. Hot-topped carbon ingot production amounted to 1,098,444 tons in January compared with 993,643 tons in December. Production by types of furnaces and by districts in January was as follows:

	Total	Per Cent of Capacity	Alloy Steel*	Hot-Topped Carbon Ingots*
Open Hearth	7,287,683	101.1	598,595	985,623
Bessemer	408,552	92.6	.....	.....
Electric and Crucible	487,260	93.8	188,703	112,821
Total	8,183,495	100.2	787,298	1,098,444
Eastern	1,630,514	101.4	127,883	300,501
Pitts.-Youngstown	3,281,111	99.9	435,220	417,864
Cleveland-Detroit	711,160	100.2	59,722	110,572
Chicago	1,726,043	98.9	151,724	253,206
Southern	398,451	107.3	5,043	7,205
Western	436,216	97.6	7,706	9,096

\* Included under total steel.

## Anti-Trust Moratorium

**Suspension of pricing actions for 16 months provided in bill approved by House committee**

HOUSE Judiciary Committee last week approved a bill providing for a 16-month moratorium on new anti-trust actions against freight absorption in pricing made in good faith by individual sellers.

Committee Chairman Celler (Dem., N. Y.) said he hoped for speedy action on the House floor in approving the bill.

The measure provides that until July 1, 1950, the Federal Trade Commission act and the Clayton act not be construed as depriving individual companies, in the absence of conspiracy or combination or other agreement in restraint of trade, of the right to use independently delivered price systems or to absorb freight to meet competition in any and all markets.

No provision of the law would apply to any case in the federal courts as of Mar. 1, 1949.

Purpose of the bill is to give the U. S. Supreme Court time to clarify its cement decision through a ruling it is expected to make in the rigid steel conduit case now before it. The cement decision, while it did not specifically outlaw basing point pricing as such, brought the practice into question and caused its use to be abandoned in the steel industry with resulting confusion and widespread uncertainty regarding pricing in general.

It was said in congressional circles last week that in event the Supreme Court fails to clarify the basing point issue when it renders its decision in the rigid steel conduit case, then the moratorium against anti-trust law action in pricing matters would give Congress an opportunity to study the situation further. This, however, in view of the extensive hearings held on the subject in recent months, would seem unnecessary and only tend to further delay disposition of the question.

## F.O.B. Mill Pricing Costly

A HIGH official of one of the independent automobile manufacturers has stated the change to f.o.b. mill pricing on steel resulted in a \$12 per car increase in his steel costs, while the last increase in base prices plus the many new and revised extras introduced by mills had added on another \$26 per car.



# Small Plants Not Overlooked

**NSRB taking positive steps to encourage fair participation of small business in current production of military requirements, running at \$1 billion monthly**

MILITARY expenditures are running at approximately \$1 billion a month, and in placement of requirements small business is not being overlooked.

This reassuring statement comes from Edward V. Hickey, director of production, National Security Resources Board, who points out adequate attention to production potentialities of small industries is a fixed policy of the Resources board in developing its program for quick expansion and conversion of industry in event of all-out mobilization.

**Plant Appraisal**—Plans of the Resources board for small business contemplate thorough advance appraisal of small plants for production of war materials. They contemplate making available to small concerns adequate blueprints and other tools and "know-how" so they can be ready to produce the moment their output is needed in an emergency. It is recognized small manufacturing facilities, already dispersed in widely separated areas, would be in position to bridge a production gap in event of wholesale destruction of large factories in congested areas.

The board, Mr. Hickey says, is taking positive steps to encourage fair

participation of small enterprises in the current production of military requirements, now running at \$1 billion monthly.

In the preparation of complete mobilization plans for each individual industry, a product assignment list has been developed that assigns the many thousands of manufactured products to specific industry divisions.

On the basis of these assignments, the board's 30 division directors have appointed more than 200 task groups to prepare mobilization plans for specific industries. These teams have been reviewing their World War II experience, the limitation orders issued by the War Production Board and other controls that affected their productive effort. They have been adding up the current capacity of their industries, anticipating potential bottlenecks in event of war, and are recommending means for avoiding such bottlenecks.

**Cites Machine Tools**—The work of the task group for the machine tool industry is cited by Mr. Hickey as an example of practical mobilization planning.

This group, among other things, recommended placing of emergency schedules of production, described as

"phantom" orders, with the tool manufacturers. At the board's request the Commerce Department surveyed the potential productive capacity of the industry, and the Munitions Board provided a list of 100,000 general purpose tools that would be needed in any expansion program for war.

With this information, pool orders for more than \$750 million worth of tools were distributed, enabling manufacturers to make their own plans for production expansion, for manpower and for supplies and parts. Subcontractors are being checked to make sure the same sources of supply are not being counted on by all the tool builders for quick deliveries under pressure.

**Ready For M-Day**—According to Mr. Hickey, all that will be necessary if there is an "M-Day" will be for a government agency, such as the Reconstruction Finance Corp., to send out telegrams authorizing execution of the orders. With those telegrams serving as legal "letters of intent" from the government, the manufacturers will be able to go to their local banks immediately and obtain whatever financing may be necessary for their expanded operations.

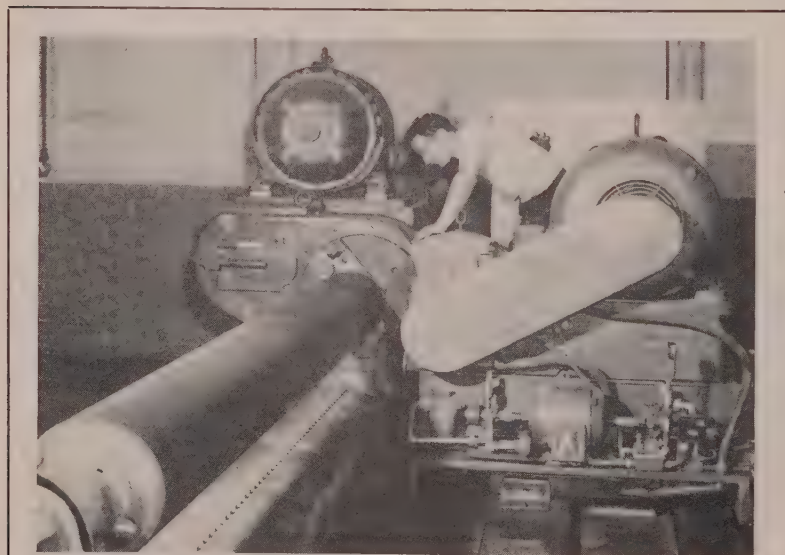
Experts close to the production problems of 1942, says Mr. Hickey, are convinced this program alone will save the nation from six months to a year in any future mobilization.

Similar detailed planning is under way in other industries. At present the board is concentrating on critical components, such as fractional horsepower motors, ball bearings and other items that were bottlenecks in World War II.

Another major project in the Office of Production, says Mr. Hickey, is the drive for plant dispersion under guidance of the Division of Industrial Services. Yardsticks for measuring plans for industrial expansion and construction of new facilities have been developed. The board's experts have determined that space between key installations is the best protection against attack with atomic weapons, and it is being urged that essential units be separated by at least three miles and that, where economically feasible, new plants be constructed in communities of 50,000 persons or less.

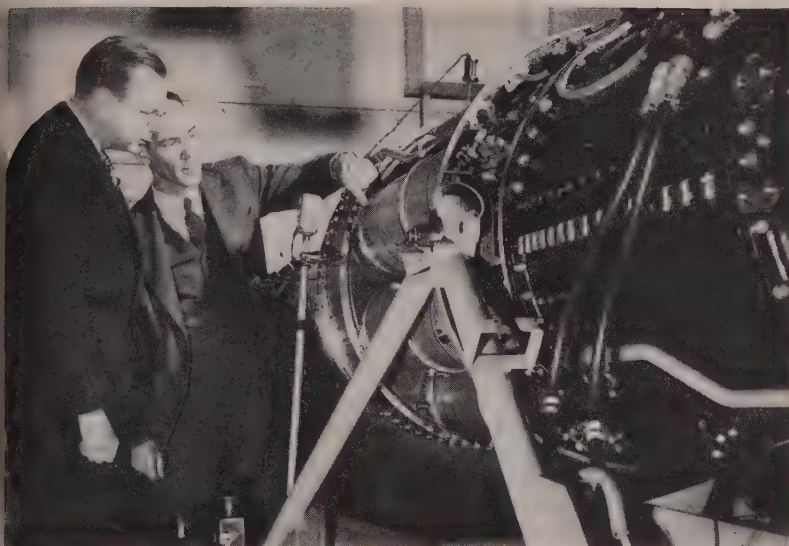
**Results Compiled**—Results of preliminary studies in this field have been compiled in a booklet, "National Security Factors in Industrial Location," and more than 40,000 copies have been distributed to key persons who participate in decisions on location of new structures.

The board is giving major attention to raw material problems, Mr.



**ROLL GRINDER:** This huge industrial roll grinder has been installed by Goodyear Tire & Rubber Co. in its newly expanded industrial roll covering department. The machine was set up in a new building along with other equipment to increase production and assure steel and other industries of prompt delivery on re-covered rolls





*Assembling and testing of J-47 jet engines has begun at the new Lockland, O., plant of General Electric Co. The engine here is mounted in a concrete cell where it will be tested at full power. K. F. Houseman, plant manager, points out design details to M. C. Hemsworth, assistant to manager in charge of test*

Hickey says. Right now it is giving unusually close attention to being sure the nation will have enough steel.

The board's Power & Utilities Division has made two nationwide surveys of electric power and natural gas production.

## Acquires Billings & Spencer Co.

BINGHAM-Herbrand Corp., Toledo, O., producer of stampings and forgings, has acquired control of Billings & Spencer Co., Hartford, Conn., manufacturer of drop forgings, and will operate the company as a division.

Roland J. Ahern continues as president of Billings & Spencer Division and E. F. Cummings as secretary-treasurer. R. W. Kerr, vice president, Bingham-Herbrand, becomes vice president of the Hartford division.

## Continuous Casting Progressing

PROGRESS is being made in the continuous casting of electric steel at the pilot plant now being operated at the Beaver Falls, Pa., works of the Babcock & Wilcox Co.

Indications are the process will be on a commercial basis by July.

Meanwhile, an arc furnace is being installed on the pouring floor to afford a larger quantity of hot metal than initially supplied by an induction furnace.

Continuous casting of stainless steel on an experimental basis will be started sometime in April at the

Watervliet, N. Y., works of the Allegheny Ludlum Steel Corp.

The process, based on patent rights of German origin, utilizes a machine built with reciprocating molds. The end product will be a slab 3 x 15 inches in cross section.

## Allegheny Installing Furnace

COMBINATION blast furnace and cupola is being installed at the Brackenridge, Pa., plant of the Allegheny Ludlum Steel Corp.

The combination unit which recently was purchased from the Rotary Electric Steel Co., Detroit, will be charged with 50 per cent of high-grade iron ore and 50 per cent scrap for the production of feed metal for electric furnaces.

## McLouth Steel Corp. Expands

McLOUTH Steel Corp. has expanded its stainless steel production and finishing facilities in a new structure erected at the Livernois avenue plant in Detroit.

The company has also begun partial production at its new facility in New Trenton, Mich. (STEEL, Jan. 24, p. 27).

## Terne Coating Line Speeds Up

NEW continuous terne coating line is nearing full production at the Gary, Ind., sheet and tin mill of the Carnegie-Illinois Steel Corp.

The 260-foot line employs a new

electrolytic pickling bath, which is the first installation of its kind ever to be used in conjunction with operation of such a production line. The new terne line is currently capable of coating coils up to 48 in. wide and weighing up to 48,000 lb, in gages from 16 to 26, with eventual capabilities of processing somewhat lighter gages.

The wide strip travels on a continuous basis through the new electrolytic pickling unit and a water scrubber operation, then through a zinc ammonia chloride flux, passing on through a hot terne mix coating bath composed of 90 per cent lead and 10 per cent tin.

## GE Jet Deliveries

**Begun to Air Force from company's new engine assembling and testing plant at Lockland, O.**

GENERAL Electric Co. last week shipped the first J-47 jet engine to the Air Force from its new Lockland, O., plant, less than five months after operations were begun.

The facility, containing 700,000 sq ft of floor area, will reach peak production in about one year. It is a division of the GE Aircraft Gas Turbine Divisions, Lynn, Mass., where the J-47 jet engine was originally designed.

All parts for the Lockland-built turbo-jets are produced by more than 120 sub-contractors—among them Wright Aeronautical and Ranger Aircraft Engine corporations and Ryan Aeronautical and Solar Aircraft companies—and assembled and tested in the Ohio plant. GE will continue to manufacture parts for engines built at Lynn.

The J-47 is the powerplant of the North American B-45, a four-jet bomber in the 550-mile-per-hour class, and the North American F-86, a penetration fighter which holds the official world speed record of 670.981 miles per hour.

Special high-temperature resistant alloys have been incorporated in the construction of the J-47 combustion chambers, nozzle diaphragm, turbine wheel and exhaust system. The engine is lubricated through a pressure feed and return oil system to bearings and accessory gears, and its electrical system comprises a GE direct drive starter-generator, two igniter plugs and two 400-cycle ignition transformers. The engine's greatly increased power output has been achieved without any corresponding increase in specific fuel consumption. It can burn either JPI fuel (kerosene) or grade 100/130 gasoline.



## Trend toward shipment of capital goods to Europe seen in latest ECA authorizations calling for \$1,333,000 of iron and steel products, and \$8,616,000 of machinery

LATEST ECA authorizations calling for iron and steel mill products, \$1,333,000, and for machinery and equipment, \$8,616,000, confirm the trend this year to capital goods and equipment for foreign aid. Emphasis in the past, has been on food, clothing and living essentials.

This development is just about what was predicted when the European aid program was projected.

Appropriations now hanging fire in Congress, if approved, will expedite heavy goods shipments during 1949.

Significantly, a major part of the recent allotment of funds for foreign aid under the ECA program covered such items as engines and turbines, construction and mining equipment, generators and motors, machine tools, metalworking machinery, railroad transportation equipment, industrial machines, including office machines, besides iron and steel mill materials, steel mill products, and ferroalloys.

**Sidelight**—As a sidelight, the ECA has concluded arrangements with a firm manufacturing drill chucks, to guarantee the convertibility of a \$400,000 investment which the firm is making in facilities in the United Kingdom. British users largely depended in prewar years, on this individual firm for drill chucks. Since the war, and despite dollar shortages, the British still needed drill chucks. So, it is indicated, the firm has made a substantial investment in a going British concern, where it will assist the British company with equipment, engineering and technical services, besides cash, in producing the needed chucks.

When this reinforced British company is in full operation, ECA said, these American-designed products will supply a substantial part of the United Kingdom's requirements.

Incidentally, the ECA said, this added source of supply, together with other production in the United Kingdom, is expected to eliminate dollar imports of this equipment, and allow an appreciable surplus for export from the United Kingdom.

The ECA cites this case as illustrative of one phase of its operations, the encouragement of a flow of American capital to Europe. The

guarantee arrangement enables the American investors to convert to dollars any foreign currencies received on such investment as income or liquidation of principal.

## Neutral Stand on Pipe Export

NATIONAL Military Establishment has established a benevolently neutral position toward steel pipe allocations by the Department of Commerce for the Trans-Arabian pipe line.

Under Secretary of Navy W. John Kenney has advised the secretary of commerce that the matter of allocation of steel pipe for such a purpose was primarily one for consideration by other departments than the military.

Actually, it was pointed out, the secretary of defense did not participate in the determination of the desirability for issuance of the export license. Mr. Kenney, as chairman of the Armed Services Petroleum Board, was authorized to represent the Military Establishment, but apparently the National Military Establishment has wished to leave it at that.

## Testify on Watch Situation

FINANCIAL difficulties of the Waltham Watch Co. served to point up testimony on the watch situation at hearings by the Senate Finance Committee on the bill to extend the Reciprocal Trade Agreements Act, to June 30, 1951.

Two witnesses for the American Watch Assemblers Association declared importation of Swiss movements not only benefits American watch buyers, but is beneficial to the U. S. government and domestic watch manufacturers as well.

Eighty-five per cent of the total retail sale price of a Swiss movement watch, they said, remains in this country, the U. S. Treasury receiving directly an amount greater than is paid the Swiss. In 1947 the Treasury received more than \$70 million in excise taxes, import duties and corporate taxes, while the total paid the Swiss for movements was only \$48,607,000.

Importation of the lower-priced Swiss movements broadened the

watch market appreciably, and while the bulk of sales went to the importers, American watch manufacturers also benefited. For example the witnesses contended importation of Swiss movements developed the total American market from 1,815,000 in 1931 to 10 million in 1947, and in doing so the market was broadened to such extent American watch manufacturers' sales rose from 900,000 in 1931 to 2,200,000 in 1947.

Only a few cents difference in cost of manufacture exists between Swiss and American movements, the assemblers claim. A labor differential of \$2 to \$2.40 per movement in the cost of producing a 17-jewel movement was admitted, but the witnesses said this is compensated by an average \$2.40 import duty, to which must be added transportation and insurance.

Two importers, Bulova and Gruen, now operate plants in this country. The latter is planning a large plant here to cost between \$3 million and \$5 million.

## To Report on Southern Plants

REPORT on 88 industrial plants established since the end of World War II in the South and the reasons why locations in the South were chosen, will form one of the first of a series of studies to be released by the National Planning Association's Committee of the South.

Another study by this specialized group will probe effects on the South of the changes in the basing point pricing system.

Technical work on the study of postwar plants in that area was done by Dr. Glenn E. McLaughlin, chief economist of the National Security Resources Board.

The importance of various location factors—markets, raw materials, labor, transportation, facilities and others, in influencing decisions to establish southern plants is described in a series of actual case studies.

The work has been under way for two and half years, and some of the studies will be expanded to book-length surveys in final form.

## Drop Charges Against Phoenix

FEDERAL Trade Commission has dropped charges of illegal price-fixing against Phoenix Iron Co., Phoenixville, Pa., as one of a number of companies named in an original complaint to this effect, on the ground



# New Features of Cincinnati Filmatic Roll Grinders

**SAVE HOURS OF TIME  
IN THE ROLL SHOP**



CINCINNATI FILMATIC 28" x 168" Heavy Duty Traveling Table Roll Grinding Machine.

... and you can depend upon having rolls of high quality when you need them. Of the new CINCINNATI FILMATIC Traveling Table Roll Grinder's many features, just consider these two that give the machine the dependability of "Old Faithful."

FILMATIC grinding wheel spindle bearings. In 10 years, over 99% have required no time off for any reason whatever.

Circulating, filtered pressure lubricating system for the ways, with electrical pressure switch protection.

There are other features, too, that pay off in time saved and improved finish:

- Automatic wheel balancing
- Electronic table traverse

A new catalog, G-587, tells you all about these new CINCINNATI FILMATIC Roll Grinding Machines. A copy is yours for the asking.



Close-up of operator at the machine, showing convenient grouping of operating controls and electrical push buttons.



**CINCINNATI GRINDERS INCORPORATED**

CINCINNATI 9, OHIO, U. S. A.

CENTER TYPE GRINDING MACHINES • CENTERLESS LAPPING MACHINES • CENTERLESS GRINDING MACHINES



that the Phoenix company is no longer making steel.

The original complaint, naming American Iron & Steel Institute and about 100 producers of steel products, charged collusive action to fix and maintain delivered price quotations and restrain competition.

The Phoenixville company, said the commission, has sold all its steel producing facilities, withdrawn from American Iron & Steel Institute, and ceased all steel production, hence is no longer involved in the complaint.

## Warns Scrap Still Is Needed

IMPROVEMENT in scrap supplies is only relative and actually 1 million more tons of heavy scrap are needed to maintain full steel mill and foundry production, Commerce Secretary Sawyer says in a statement urging industry to continue its efforts to collect scrap.

The occasion for the statement was the announcement of a letter

from Robert W. Wolcott, chairman, American Iron & Steel Institute's scrap committee, in which it was pointed out many persons were permitting the present improvement in scrap supplies to interfere with their full support of the nation-wide collection drive launched some time ago.

## Report on Titanium Available

REPORT of the symposium on "Titanium" held by the Office of Naval Research in December will be available to the public at a nominal charge about Apr. 1. Requests for copies should be addressed to the superintendent of documents, Government Printing Office, Washington 25, D. C., and requests should specifically mention the report by its title, "Titanium," so as to avoid possible confusion.

## Named to Research Position

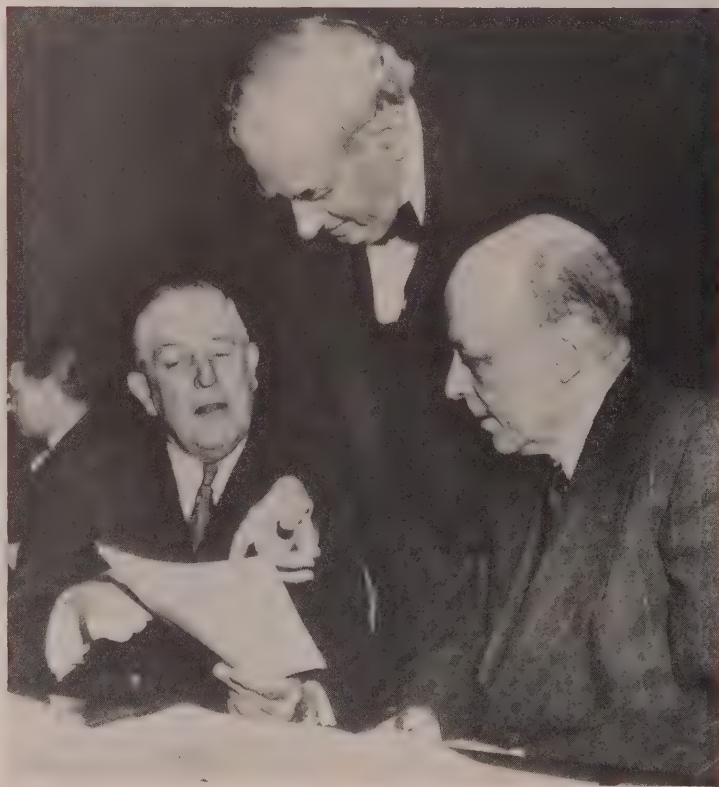
APPOINTMENT of Bruce L. Wilson as chief, Engineering Mechanics Sec-

tion of the National Bureau of Standards, has been announced. He will direct research on structural elements and metal structures to determine their strength, deformation under load, and other mechanical properties, correlating the results with the theory of elastic and inelastic behavior of materials. In addition, he will conduct research on special apparatus and methods for measuring forces, deformations, and hardness, and methods for calibrating such equipment.

Formerly Mr. Wilson was in charge of experimental research to determine fatigue strength of screw threads of various thread forms for tests being made by the Standards Bureau in co-operation with the British National Physical Laboratory and the Canadian National Research Council.

## Washington Notes

THERE are now 865,000 veterans of the armed forces on the federal payroll, representing 46 per cent of total government employment. . . . The Department of Labor's Bureau of Labor Statistics is overhauling its cost-of-living index so as to make it reflect more accurately postwar buying habits. . . . Spending by the states last year totaled more than \$10 billion, up sharply from the \$8,102,000,000 reported for 1947, according to the Census Bureau. Twenty-six states spent an average of \$70 per person in 1948 compared with \$57 in 1947. . . . Figures of the Public Roads Administration show highway construction contract awards declined more than five per cent last year while the cost of road projects increased. . . . Construction was begun on 50,000 new permanent non-farm dwelling units in January, 6000 under the estimate for December and 2600 under the starts in January a year ago. . . . Administrator Raymond M. Foley of the Housing & Home Finance Agency is seeking co-operation of attorney generals throughout the nation in developing improved and standardized building codes. . . . USAF's newest research aircraft, Model 7002, is undergoing flight tests to determine the stability and control characteristics of the Delta wing, which differs from conventional wings in that it has a much larger degree of sweepback, is triangular shaped and eliminates need for a tail section. . . . Office of International Trade reports the Japanese Board of Trade, Tokyo, is taking bids until Mar. 15 on 400,000 tons of heavy coking coal for delivery beginning Apr. 30.



**JUSTIFIES SPENDING:** Replying to a statement by Christopher Mayhew, British Undersecretary for Foreign Affairs, that Britain's recovery is virtually accomplished, U. S. Foreign Aid Chief Paul G. Hoffman, left, warns that reduction in the British aid program would jeopardize recovery in all western Europe. Listening are Sen. Tom Connally (Dem., Tex.), chairman, Senate Foreign Relations Committee, center, and Thomas K. Finletter, chief, ECA London mission. NEA photo



# Europe's Business Tighter

**Ambiguities in U. S. supply-demand situation for steel have counterparts abroad**

AMBIGUITIES in the American supply-demand situation for steel are having counterparts in Europe.

Demand is still considered to exceed supply despite slowly increasing steel production, but business nevertheless is tightening. Great Britain is experiencing export dislocations because of currency problems. Western Germany chafes at new controls placed on exports to Latin America. France is alarmed at "growing German competition." Belgium and Luxembourg have shaded their overseas steel prices.

Approximate domestic prices for European steel products are as follows, per metric ton (export quotations are usually higher and in many cases on a negotiated basis):

	Britain	W. Germany	France	Belgium
Pig Iron ..	\$39.00	\$43.50	\$46.20	\$61.50
Steel Ingots	73.20	63.60	67.50	69.60
Plates ....	73.50	70.20	84.00	72.00
Sheets ....	90.30	90.00	101.10	85.50

## Great Britain

ALTHOUGH the overseas demand for steel is still far in excess of supply, currency problems are restricting British activity, and more material is going to dominion and colonial destinations. The British export price level is still below that of European competitors, despite the Belgium and Luxemburg cuts.

Britain's automobile industry is making strenuous efforts to increase its foreign business. With signs appearing of a return to a buyers' market in America, Britain foresees slackening U. S. demand for its product.

Because of steel shortages, the industry is operating below capacity, with higher costs resulting. For the first time since the war, the home market is getting serious study. The domestic target for 1949 has been raised to 75,000 cars, 50,000 trucks and 7700 busses and coaches. About 90 per cent of the cars on British roads were purchased before 1947, and the commercial fleet is almost as old. Greatest drawback to domestic sales is gasoline rationing.

## Western Germany

TIGHTER Allied regulations put German exports to Latin America under severe licensing and place greater restrictions on other overseas shipments to all countries but the United



**STEEL EXPORTS:** Revised export controls to permit American steel exporters to compete in foreign markets are urged by Milton R. Wexler, right, counsel for National Association of Steel Exporters, who is conferring with Sen. Burnet Maybank, center, chairman of the Banking & Currency Committee, and Samuel Anderson, left, director of the Industries Division of ECA. The Senate committee recently held hearings on the subject when Mr. Wexler testified that controls should be limited to keeping export policy in line with foreign policy

States, Canada and the Sterling and ECA nations.

German industrialists are protesting this move, hinting at British and American competitive pressures. Originally, 350,000 tons of steel and steel products were scheduled for export during 1949, but this may be cut to only 200,000 tons. The Germans say this constitutes an especially severe hardship because a slight recession has now set in.

Unemployment in the American and British zones has risen to 944,200, and a small, but significant, drop in prices has occurred. Bankruptcies are increasing in southern Germany, while the construction and heavy industries are suffering from lack of capital.

The steel export curb has given impetus to plans to triple the output of the automobile industry whose steel allocations may now be increased. The industry hopes to turn out 92,000 cars in 1949, compared with 30,000 in 1948; 67,000 trucks against 23,000; 3400 busses against 850; 8000 truck-trailers against 1500. The production of cars will be shared by seven companies, chiefly Volkswagenwerke, Daimler-Benz, Opel (General Motors) and Ford. About 11 per cent of total industry production was exported in 1948. About 6000 cars went overseas last year, compared with almost 30,000 in 1936.

Encouraging factors on the German economic scene include a decline in dismantlings and increased coal production in January—8.2 million tons mined, compared with 8.1 in December.

## France

FRANCE is devoting closer attention to competing steel prices, and is particularly concerned by the fact that western German quotations are lower in nearly every instance.

Highlighting the situation is growing German competition in the Near East where French tube makers, to keep business, must sell at a loss. France claims that the Ruhr has unfair competitive advantage because of special prices for Swedish ore and low-cost subsidized coal.

Some hope that French costs may be lowered rests with the government's \$2.5 billion program to repair war damage and modernize industry this year. About 37 per cent of the necessary funds will be raised by taxation, 37 per cent will come from Marshall aid counterpart funds, 13 per cent from government bond issues and 13 per cent from miscellaneous sources.

## Belgium

SHORTAGE of Belgian francs is the major limiting factor in the nation's



vital export trade. Steel prices have been shaded to meet growing competition, but overseas shipments in this line are expected to continue steadily, particularly to the United States and Great Britain.

The major problems have arisen in the shipbuilding industry and in metal products like machine tools. Machine tool makers are now limping along through production of replacement parts. Even scrap prices are falling slightly.

Output of pig iron in 1948, at 3,942,536 metric tons, was 124.4 per cent of the 1936-1938 average. Steel ingot production was 125.6 per cent of prewar; rolled steel was 137 per cent and steel castings 86.4 per cent. Total output of raw steel for 1948 was 97 per cent of the record 1929 production. Coal mined in 1948, at 89 per cent of 1939 figures, is still insufficient.

## Denmark

DANISH steel plate production for ships will be increased with installation in Denmark of Youngstown Sheet & Tube Co.'s old Brier Hill plant which was retired about a year ago as obsolete and sold to Denmark. The Danes plan to begin rolling plate by next fall.

## British Foundry Team Coming

FIRST of 35 productivity teams to come to this country this year under sponsorship of the Anglo-American

Council on Productivity will be drawn from the steel foundry industry, the Council's United Kingdom section and the Economic Cooperation Administration have announced.

The British Steel Founders Association, the Engineering & Allied Employers National Federation, and the Confederation of Shipbuilding & Engineering Unions have arranged to set up a joint committee which will select members of the team.

The team, consisting of 12 to 15 members, is expected to arrive in this country about Mar. 14 and will be here approximately seven weeks studying production methods of the steel foundry industry. Visits of such productivity teams are planned to encourage an on-the-spot interchange of information on industrial methods and production techniques. Upon their return home, team members will report on ideas which might make for greater productivity in industries in the United Kingdom.

## Manganese Found in North Brazil

HUGE manganese deposits, with ore assaying as high as 58 per cent pure metal, have been discovered in Amapa in northern Brazil, 2000 miles closer by sea to the United States than the present Brazilian sources of supply.

American steel companies have had difficulty in obtaining manganese from developed Brazilian deposits in Minas Gerais because of the in-

creasing domestic needs of that country, according to Jose Garrido Torres, trade director for the South American nation.

The Amapa manganese can be obtained from the surface in extensive outcroppings along the Amapa river above the river port of Porto Grande, which is connected by highway with Macapa, a seaport with improved harbor facilities. Presence of numerous falls on the area's rivers gives the territory a hydroelectric potential, said Mr. Garrido Torres, making possible eventual establishment of smelters at the site of manganese deposits.

## Plan Integrated Steel Plant

THE STEEL plant of Fomento Corporación de Chile is to be fully integrated, according to data filed with the Export-Import Agency which just has loaned the company \$20 million in addition to \$28 million it advanced in 1945. The plant, at Concepcion, Chile, will have deep-water pier and other raw materials handling facilities, re-rotary type coke ovens and byproduct plant, blast furnace, bessemer and open-hearth steelmaking facilities, a blooming mill, and finishing mills for producing plates, sheets, tin plate, reinforcing roads and merchant bar products.

Capacity will be 203,000 metric tons of pig iron, 236,400 metric tons of ingots, and 158,600 metric tons of finished rolled product, annually.

Total cost is estimated as equivalent to \$83 million of which \$60 million will be expended in the United States for equipment, materials and services. By agreement with the bank, the Koppers Co., Pittsburgh, participates in the management of the company both during the construction and, later, the operational stages. Construction of the plant now is about 18 per cent completed.

## Approve Screw Thread Standard

AMERICAN Standards Association has just given its final approval to a new American standard which puts into effect the unified screw thread system agreed upon by Great Britain, Canada, and the United States by the declaration of accord signed in Washington last November.

The British Standards Institution and the Canadian Standards Association are working on similar standards to put the unification plan into effect in their countries.

This American standard, unified and American screw threads for bolts, nuts, and other threaded parts,

## Calendar of Meetings

Mar. 8-10, Society of Automotive Engineers: National passenger car, body and production meeting, Hotel Book-Cadillac, Detroit. Society headquarters are at 29 W. 39th St., New York.

Mar. 10-12, American Society of Tool Engineers: Seventeenth annual meeting, Hotel William Penn, Pittsburgh. Society headquarters are at 1666 Penobscot Bldg., Detroit.

Mar. 11-12, Ohio Regional Foundry Conference: Second conference, to be held on Ohio State University campus.

Mar. 14-17, Chicago Technical Societies Council: Seventh Chicago production show. Show manager is Edward C. Bowman, 8 S. Michigan Ave., Chicago.

Mar. 17-18, American Management Association: Meeting to discuss competitive marketing methods in buyers' market, Hotel Statler, New York. Association headquarters are at 330 W. 42nd St., New York.

Mar. 22-23, Export Managers Club of New York Inc.: Meeting, Hotel Statler, New York. Club headquarters are at 2 Lafayette St., New York.

Mar. 24-26, Electrical Maintenance Engineers Association of Southern California: Third annual industrial electrical show, Shrine Convention Hall, Los Angeles.

Mar. 28-Apr. 1, American Chemical Society: 115th national meeting, on sour crude oil, San Francisco.

Mar. 30-Apr. 1, American Iron & Steel Institute: Meeting of chairmen and presidents of company members. The Greenbrier, White Sulphur Springs, W. Va.

Mar. 30-Apr. 1, Institute of Metals: Annual general meeting at Institution of Mechanical Engineers, London.

Apr. 4-6, National Sanitary Supply Association: First institute of sanitation and modern cleaning methods, Hotel Sherman, Chicago. Press headquarters for the association are at 220 S. State St., Chicago.

Apr. 5-6, Metal Powder Association: Fifth annual meeting and exhibit, Drake Hotel, Chicago. Association headquarters are at 420 Lexington Ave., New York.

Apr. 6, Detroit Chapter of American Foundrymen's Society: Congress of foundry experience, Rackham Memorial Bldg., Detroit. Jess Toth, Harry W. Dietert Co., is committee chairman for event.

Apr. 11-12, American Zinc Institute: 31st annual meeting, Hotel Statler, St. Louis. Institute's Galvanizers Committee will meet concurrently with the general convention. Institute headquarters are at 60 E. 42nd St., New York.

Apr. 11-12, American Institute of Electrical Engineers: Conference on industrial application of electron tubes, Hotel Statler, Buffalo. Institute headquarters are at 33 W. 39th St., New York.

Apr. 11-12, American Machine Tool Distributors Association: Meeting, Hotel Oglethorpe, Savannah, Ga.

Apr. 11-13, American Society of Lubrication Engineers: Annual convention, Hotel Statler, New York. Lubrication show will run concurrently with the convention.

Apr. 11-15, Magnesium Association: Annual meeting, Edgewater Beach Hotel, Chicago.



## 1947 CENSUS OF MANUFACTURES DATA BEING RELEASED

MARKED increases in the value of 1947 shipments over 1939 figures are shown in the first group of industries included in the new Census of Manufactures being compiled by the Bureau of the Census, Department of Commerce. The current census is the first by the Commerce Department since 1939 and should provide complete and accurate data on the growth of American industry since the prewar period.

Number of production workers also climbed sharply in the seven industries in the metalworking and metalproducing fields included in early releases of the Bureau of the Census. Data on other industries of interest to the readers of STEEL will be published upon release by the bureau.

Following is a brief summary of the data included in the accompanying table:

**Primary Aluminum**—Value of shipments increased 148 per cent, number of production workers increased 161 per cent and amount expended for wages increased 436 per cent in the same period.

**Domestic Laundry Equipment**—Value of shipments increased 617 per cent, number of production workers

increased 217 per cent and amount expended for wages increased 605 per cent.

**Electrical Appliances**—Value of shipments increased 442 per cent, number of production workers increased 173 per cent and amount expended for wages increased 481 per cent.

**Screw-Machine Products**—Value of shipments increased 319 per cent, number of production workers increased 134 per cent and amount expended for wages increased 382 per cent.

**Storage Batteries**—Value of shipments increased 252 per cent, number of production workers increased 43 per cent and amount expended for wages increased 202 per cent.

**Vacuum Cleaners**—Value of shipments increased 280 per cent, number of production workers increased 214 per cent and amount expended for wages increased 567 per cent.

**X-ray and Therapeutic Apparatus**—Value of shipments increased 236 per cent, number of production workers increased 193 per cent and amount expended for wages increased 470 per cent.

	Primary Aluminum		Domestic Laundry Equipment		Electrical Appliances		Screw Machine Products		Storage Batteries		Vacuum Cleaners		X-ray and Therapeutic Apparatus	
	1947	1939	1947	1939	1947	1939	1947	1939	1947	1939	1947	1939	1947	1939
Number of Plants .....	11	4	65	42	325	118	1,207	288	247	190	34	21	116	77
All Employees:														
Number (average for year) .....	8,919	3,345	28,403	9,610	43,850	..§	28,492	..§	16,607	..§	14,880	..§	7,678	..§
Total Salaries, Wages .....	\$26.4	\$5.1	\$90.4	\$13.9	\$112.9	..§	\$86.9	..§	\$48.5	..§	\$44.8	..§	\$23.2	..§
Production Workers:														
Number (year average) .....	7,339	2,802	23,651	7,466	36,837	13,572	24,740	10,571	13,660	9,564	12,232	3,886	5,621	1,920
Man-hours (total) .....	16.0	..§	48.6	..§	77.5	..§	52.2	..§	29.6	..§	24.4	..§	11.8	..§
Wages (total) .....	\$20.9	\$3.9	\$65.6	\$9.3	\$94.7	\$16.3	\$68.9	\$14.3	\$38.3	\$12.7	\$35.3	\$5.3	\$15.4	\$2.7
Value Added by Manufacture .....	\$64.7	\$36.9	\$161.8	\$25.2	\$233.6	\$42.2	\$143.9	\$31.7	\$114.7	\$35.8	\$92.0	\$33.1	\$40.0	\$12.0
Cost of Materials, etc.† .....	\$95.7	\$27.7	\$280.5	\$36.4	\$231.9	\$42.6	\$76.7	\$20.9	\$183.8	\$48.9	\$74.0	\$9.1	\$19.1	\$5.7
Value of Shipments* .....	\$160.4	\$64.6	\$442.3	\$61.6	\$459.0	\$84.8	\$220.5	\$52.6	\$298.4	\$84.8	\$160.2	\$42.2	\$59.5	\$17.7
New Plant and Equipment .....	\$2.8	\$1.8	\$9.6	\$1.6	\$16.0	..§	\$10.8	..§	..§	..§	\$4.5	..§	\$2.3	..§

\* Value of production for 1939.

† Also includes fuel, electricity and contract work.

§ Not available.

In above table all money figures and man-hours are in millions.

Source: Bureau of the Census, Commerce Dept.

B11-1949, presents in tables, diagrams, and formulas the dimensions of the unified threads, as well as those threads which for the time being remain standard in the United States alone.

The association has prepared a detailed analysis of the new American standard, including a comparison with the 1935 edition which it supersedes. Copies of this analysis are available upon request.

### Lake Ore Ships Idle Until Apr. 5

NO VESSEL on the Great Lakes will carry iron ore or coal before Apr. 5—ice or no ice—because insurance rates on this type of cargo are prohibitively high until then.

Ordinarily it would be about Apr. 5—a time set by insurance companies—before the Upper Lakes ice floes would be breaking up, but this year the mild weather holds promise of clear waters unusually soon. The

high insurance rates don't apply to vessels using Lower Lake ports only, and the first auto carrier may sail from Detroit as early as Mar. 16.

### Magnesium Production Up

PRIMARY magnesium ingot production of 20 million pounds in 1948 represented an increase of about 12 per cent over 1947 output, according to Magnesium Association, New York. Total magnesium metal used during the year, including secondary magnesium, was about 30 million pounds.

### Data Show Television Growth

RAPID growth of television is indicated in a report just issued by the Federal Communications Commission. At the beginning of the year there were 50 television stations on the air in 30 cities, and when all the then authorized TV stations start operating, a total of 71 cities will

have one or more visual broadcast stations. In addition, applications are pending for stations in 94 other cities. In all, applications for TV stations have been received from 165 cities.

As of the end of last year a total of 124 TV stations had been authorized, of which seven had been licensed and 117 held construction permits. In addition to the seven stations licensed, 43 others were on the air under temporary authorizations, 74 stations were under construction and pending applications were under consideration from 311.

Estimated construction costs of authorized TV stations amounted to more than \$30,300,000 and \$66,300,000 for the pending applications, or a total in excess of \$96,600,000.

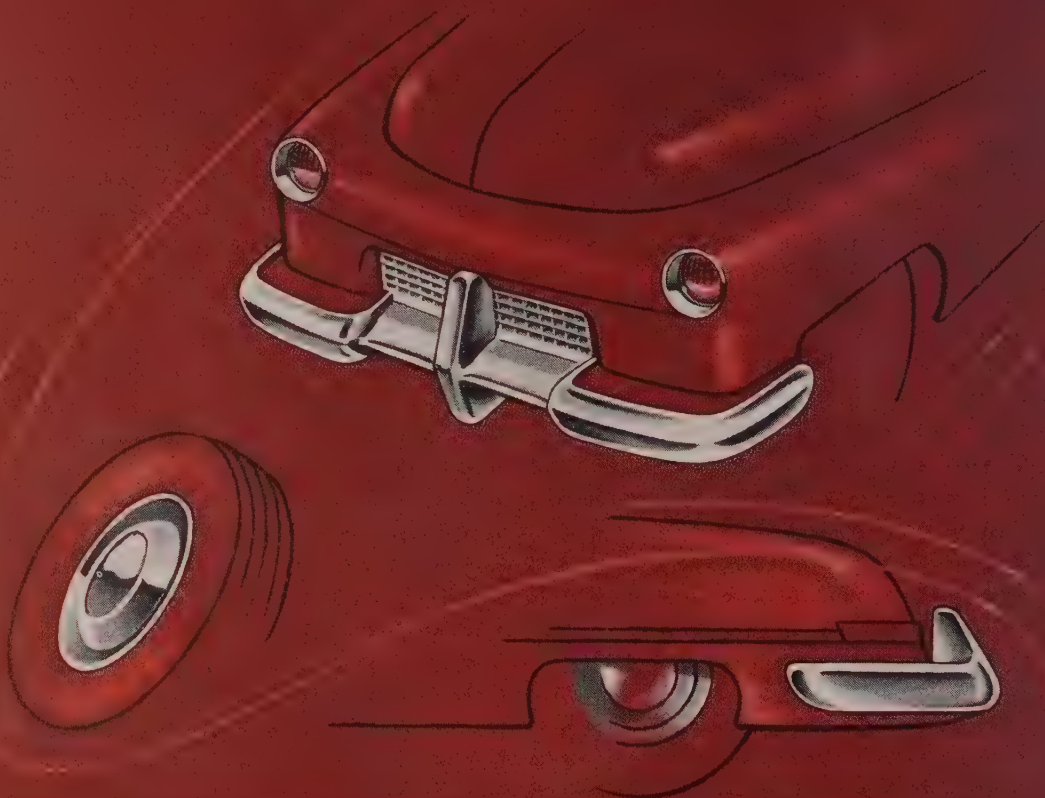
More than 1 million TV sets, having an estimated total retail value of between \$300 million and \$400 million, have been produced since the end of the war.



*The trend is to*

**N-A-X**

**HIGH-TENSILE STEEL**



Since 1940, when Great Lakes Steel pioneered the application of high-tensile, low-alloy steel to cold-stamped automobile bumpers, there has been a growing trend to N-A-X HIGH-TENSILE steel in the automobile industry.

Today, every car manufacturer is using the inherent better properties of N-A-X HIGH-TENSILE steel for some part of his automobile.

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Unit of National Steel Corporation



## General Motors price reduction, coinciding with cut in hourly wage rates, viewed as adroit move from public relations standpoint. Also seen potent as competitive factor

### DETROIT

**TIMING** of the General Motors price reduction—\$10 to \$40 on passenger cars and \$100 to \$150 on light-duty trucks—was determined to coincide nicely with the 2-cent hourly break in wage rates occasioned by a 2.7-point decline in the consumer price index. Actually the new prices do not wipe out increases tacked on 1949 models, but the move was an adroit one from a public relations standpoint. It had been under consideration for several months and only a handful of top executives knew of the plans.

The action carried even greater potency from a competitive standpoint for it came within a matter of hours after Chrysler's announcement of a 6.6 per cent price boost on its 1949 models.

Caught a little off guard, about all Chrysler officials could say was that they were "interested" in GM's move, suggesting that perhaps it was dictated by a desire to bring GM prices more into line competitively. With GM now accounting for 37 per cent of all car and truck sales, this line of reasoning is a little weak. Obviously, however, Chrysler had to say something, so it pursued the thought that GM was earning a higher percentage of profit on sales than Chrysler and, therefore, decided to trim this profit.

**Above Automotive Level**—Actually GM's profits on automobile sales are probably no higher than those of Chrysler. The reason why GM earned 9.5 per cent on sales, according to the latest figures, is that profits on nonautomotive items — locomotives, diesel engines, refrigerators, etc.—are considerably above the automotive level and serve to boost the overall percentage.

Although a Chicago newspaper managed to pry out of E. R. Breech the statement that Ford planned to adjust prices this spring in line with competition and manufacturing costs at that time, there was no comment from Mr. Breech when he returned to Detroit, nor from company headquarters. Rather, it was disclosed Ford and Mercury production will be increased substantially over the

next four months, although Lincoln output will be trimmed by one-third.

**To Boost Assemblies**—Ford schedules are being increased so that average monthly assemblies for March, April and May will be approximately 71,400 passenger cars and 21,400 trucks, a total of 92,800. In June this will be stepped up to 87,000 passenger cars and 22,000 trucks. Highest postwar production of cars and trucks combined was in December, when 88,141 were built. Con-

mand in the high-priced field. Greater steel availability is noted by practically all manufacturers and study was being given last week to the \$10 per ton reduction in cold-rolled sheet prices announced by one mill. Observers have noted long rows of ingots in a storage yard at the Ford Rouge plant awaiting rolling.

Lincoln production is being rearranged so that both the regular and cosmopolitan models will be produced in Detroit, thereby limiting layoffs to approximately 450. Increased Mercury schedules will take up the slack at three branch assembly plants in Metuchen, N. J., St. Louis and Los Angeles.

**Thousands Affected**—The 2-cent reduction in the cost-of-living allowance affects 273,000 hourly-rated employees in General Motors plants. Meanwhile, about 68,000 salaried employees will find their quarterly cost-of-living allowance reduced from \$40 to \$30 for March, April and May. The \$40 allowance for December, January and February will be paid to them this month.

This is the third time since the GM wage adjustment formula was inaugurated for both hourly-rated and salaried employees in May last year that the cost-of-living allowance has been reviewed. Last September, because of a sharp rise in the index, hourly-rated personnel received an upward adjustment of 3 cents, making their total cost-of-living allowance 8 cents per hour at that time. Salaried employees received an upward adjustment of \$15 for the quarter, making a total adjustment of \$40 for the period. In December, no adjustments were required.

Expected comment from the UAW-CIO ran to this effect, "The piddling GM price reductions are another instance of too little, too late. . . they may be soothing public relations balm for GM but they do not represent significant savings to car buyers."

**Sales Hit New High**—Chrysler Corp. sales for 1948 hit an all-time high of \$1568 million, yielding net earnings of better than \$89 million, equivalent to 5.69 per cent on sales, comparing with 4.93 per cent in 1947. The 1948 rate of earnings was exceeded in nine separate years of the corporation's history. Total production in United States and Canadian plants, according to the annual report issued late last month, was

### Automobile Production

#### Passenger Cars and Trucks— U. S. and Canada

	1949	1948
January . . . . .	459,260	422,236
February . . . . .	445,635*	399,471
March . . . . .		519,154
April . . . . .		462,323
May . . . . .		359,996
June . . . . .		454,401
July . . . . .		489,736
August . . . . .		478,186
September . . . . .		437,181
October . . . . .		516,814
November . . . . .		495,488
December . . . . .		514,337
12 mos. . . . .		5,549,323

\* Preliminary.

#### Estimate for week ended:

		(Same week)
	1949	1948
Feb. 12 . . . .	108,911	83,996
Feb. 19 . . . .	114,207	110,536
Feb. 26 . . . .	116,175	120,130
March 5 . . . .	118,000	108,343

Ward's Automotive Reports

templated June level has not been exceeded since June, 1937, when the total was 119,955.

Mercury assemblies will approximate 16,560 in March, 16,990 in April, 18,900 in May and 19,800 in June. January total was 13,757, February 13,637, so a 20-25 per cent increase is in prospect.

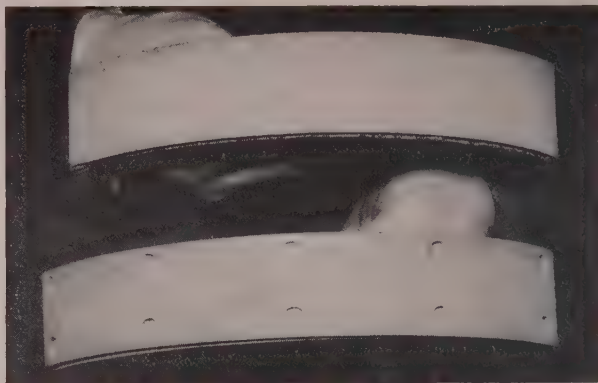
Reasons for the Ford-Mercury increase center around an improved supply of steel, while the Lincoln cut reflects material reduction in de-

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**BONDED BRAKE LININGS:** To be used on Chrysler-built and Chevrolet cars for the first time this year, the bonded process promises to lengthen materially the life of brake shoe linings. At left is shown how the lining, bonding agent and brake shoe, assembled inside a pres-



sure band, are laid out before baking at the Chevrolet gear and axle plant. On the right at the top, the bonded brake shoe is seen where almost the entire thickness of the lining is usable. At the bottom is a riveted brake surface, usable only until rivet heads are reached

1,064,759, a volume exceeded only three times before, in 1937, 1940 and 1941.

### Chrysler Studies Capital Setup

CHRYSLER directors have decided to recommend a change in the capital structure of the company by restating par value of common stock from \$2.50 to \$25 a share by the transfer to capital account of an amount of surplus sufficient to bring the capital up to an amount equal to \$25 for every share of common issued. Also it will be recommended that total authorized shares be increased from 15 to 20 million. Special stockholders' meeting to act on the proposals will be held Apr. 19. President K. T. Keller explains the change will make the capital of the company \$224,218,750, or more realistic to the nature and growth of the company's operations and the amount of capital permanently necessary for carrying on the business.

### Independents' Field Stocks Up

CONSIDERABLE discussion of allegedly out-size field stocks of some independent manufacturers is heard. In reviewing this matter, it must be kept in mind that production schedules usually involve a fairly even flow of new cars from the assembly line, regardless of the season. Careful checks on distribution patterns over the past ten years or more show that December, January and February normally are slow months. January, for example, might average only 6 per cent of a total year's output, while this figure might rise

to 11 or 12 per cent in April and May. On this basis, field stocks will accumulate in the slow months, will be whittled down to normal in the spring. It is true there is no guarantee of this, but manufacturers need some basis to figure on, and they reason logically that if they are going to the expense of carefully calculating historical patterns they had better have faith in them or toss the whole thing out of the window. So if a manufacturer should have, say, the equivalent of six weeks' production now in the field, chances are he is not worrying too much since the odds are strongly in favor of these stocks being worked off in the coming three months.

### Preparing for Competition

WILLYS-OVERLAND suspended production week before last as a step toward gearing operations to a competitive market. Many vendors have been notified to stop shipments indefinitely pending a restudy of inventory position. Unusually severe weather in western states has had a crippling effect on sales of jeeps and trucks, these areas accounting for approximately 20 per cent of the plant's output. Willys production so far this year has come to about 18,000 units, against nearly 25,000 in the same period last year. When assemblies are resumed, there will be a realignment of departments involved, with the view of reducing costs. Closing of sections of the Toledo plant gave rise to a gust of rumors over future plans and the extent of the shutdown, many of them coming from union sources. Most of the reports seemed

to hint at price reductions being necessary to sustain anything like the level of operations in recent months.

James D. Mooney, Willys president, is a real fighter and can be expected to come up with some ideas which will keep the company moving along at the profitable rate it has achieved. Only last fall he said he would welcome the early return of a truly competitive market, and was getting "damned sick" of several years of not having to sell anything, in the accepted sense of the word. His health should now improve.

### Packard Showing Outstanding

PACKARD directors have declared the largest dividend in nearly 19 years—25 cents a share, or the equivalent of \$3.75 million on the 15 million shares outstanding. Final figures on 1948 operations are still in process of completion and should constitute a crowning financial achievement in a half-century of manufacturing. Two dividends were paid last year, one of 15 cents and one of 20 cents.

### Ford Stack Nears Capacity

"C" BLAST furnace at the Ford Rouge Plant has poured out better than 100,000 tons of iron since it was lighted last November. Daily tap has been averaging 1200 tons, and full capacity of 1400 tons daily will be reached this month when new ore and coke transfer cars are installed. Five submarine or torpedo-type iron ladles recently were received and bricked up, supplementing the regular 75-ton, open-top, hot metal cars.



# Federal

FIRST IN RESISTANCE WELDING

## BENCH WELDERS

### Federal Series

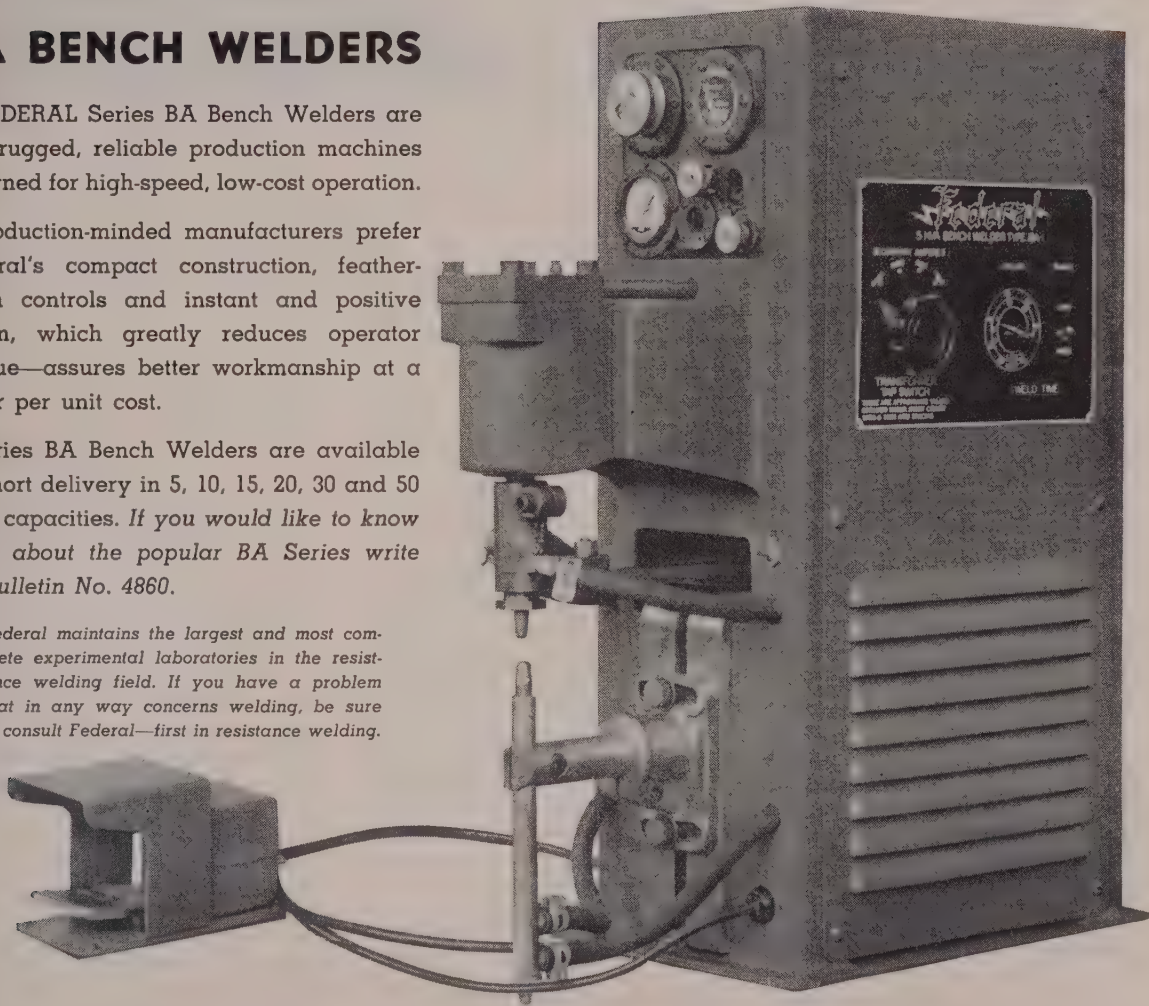
### BA BENCH WELDERS

**F**EDERAL Series BA Bench Welders are rugged, reliable production machines designed for high-speed, low-cost operation.

Production-minded manufacturers prefer Federal's compact construction, feather-touch controls and instant and positive action, which greatly reduces operator fatigue—assures better workmanship at a lower per unit cost.

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## Bethlehem Capacity Up

By yearend, its ingot potential will be 15 million tons, a 30 per cent gain in ten years

BY THE end of 1949, a \$400 million postwar construction program will have increased Bethlehem Steel Co.'s ingot capacity to about 15 million tons, a 30 per cent gain since 1939.

The company, according to its annual report for 1948, produced 13,411,000 net tons of ingots during the year, exceeding the previous record year of 1944 by 149,000 tons. Orders on hand as of Dec. 31 totaled \$671 million, compared with \$407 million in the previous year. Company shipped 9,993,181 tons of steel products, compared with 9,403,067 in 1947.

Major expansion projects completed by Bethlehem in 1948 include: A 32-in. blooming mill at Los Angeles; coal-washing plant at Mariana, Pa.; battery of coke ovens and additional electrolytic tinplate capacity at Sparrows Point, Md.; 61-spool planetary strander at Williamsport, Pa.; new section to 21-in. mill hot beds at Lackawanna, N. Y.; turbo-blower at Steelton, Pa.; blast furnaces; rod-welding unit at Lebanon, Pa.

Programs now under way or planned include development of Venezuelan iron ore properties, installation of another coke oven battery at Sparrows Point and construction of additional shipbuilding facilities at the Quincy, Mass., Beaumont, Tex., and Hoboken, N. J., yards.

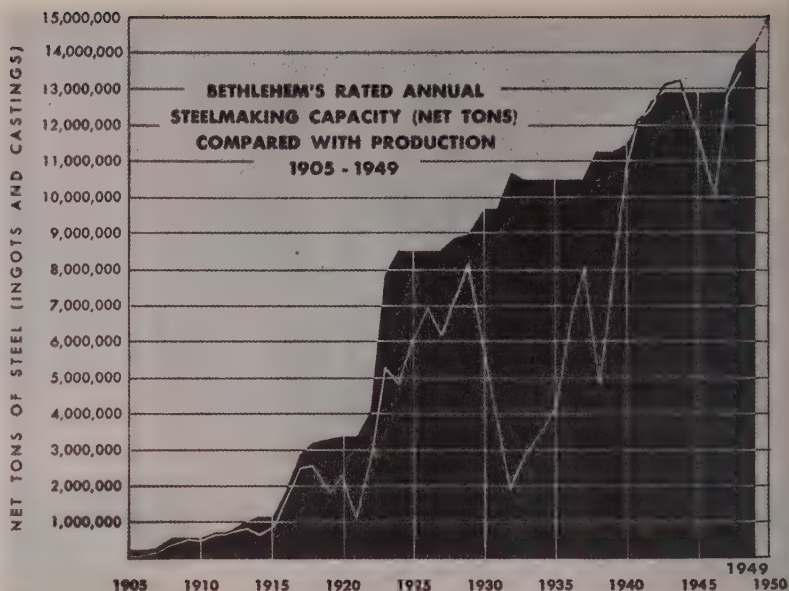
Bethlehem had a net income of \$90,347,560 in 1948 on total revenues of \$1,315,188,536, compared with \$51,088,375 on revenues of \$1,034,856,444 in 1947. Profits per dollar of total revenue amount to only 6.9 cents for the year.

## Rust Forms New Company

FORMATION of a new company to facilitate handling of overall contracts in the fields of chemical processing and refining work has been announced by S. M. Rust Jr., president, Rust Engineering Co., Pittsburgh.

The new firm, called Rust Process Design Co., will handle prime contracts for design, engineering and construction, particularly in the petro-chemical and organic chemical fields, with personnel that is also experienced in conventional and specialized refinery operations and fine chemical processes.

The new company will take over the expanding activities of the Process Engineering Division of the par-



White line on the above chart shows Bethlehem's steel production as compared with rated annual steelmaking capacity. Throughout much of the company history, capacity has amply exceeded the production rate. For two of the war years, 1943 and 1944, output was slightly above rated capacity. The new capacity of 14.2 million tons, as of Jan. 1, 1949, is expected to be increased to about 15 million tons by the end of the year

ent company under an executive committee headed by four process engineers from the former division. They are: Walter L. Bass, Dr. John A. Patterson, Leonard A. Wasselle and Dr. Wendell W. Waterman.

## United Uses Host of Suppliers

MORE than 5000 subcontractors and suppliers in 36 states contributed goods and services to the finished products of United Aircraft Corp., East Hartford, Conn., during 1948. Pratt & Whitney Aircraft, the engine division of the corporation, alone required parts, raw materials and services from more than 4000 firms.

Hamilton Standard Propellers Division drew on 1494 suppliers and Chance Vought Aircraft Division used products of 131 machine and tool shops and general subcontractors to turn out its jet and piston powered Navy fighter planes. Sikorsky Aircraft Division called on 173 subcontractors for its helicopter output.

## National Supply Co. Expands

NATIONAL Supply Co., Pittsburgh, producer of oil country goods and building trade items, will spend \$6 million to complete an improvement program which has already cost \$17,735,000 since 1945. About \$5

million of the remaining \$6 million will be spent in 1949.

Projects at the company's plants in Etna, Pa., and Springfield, O., will be finished in the second quarter of 1949. Modernization of the plants at Torrance, Calif., and Ambridge, Pa., will be completed in 1950. Major project in 1948 was completion of work at the Toledo, O., plant.

National Supply's business volume is expected to continue at a high level through 1949, but somewhat below last year. Net income for 1948 was \$12,227,362, highest in history and \$3,635,555 higher than in 1947. Sales in 1948 totaled \$160,100,318, highest in peacetime, second highest in history and \$26,529,728 higher than in the previous year.

## Koppers Dissolves Subsidiary

KOPPERS Co. Inc., Pittsburgh, will dissolve its wholly-owned subsidiary Missouri-Illinois Furnaces Inc.

The subsidiary owns a blast furnace and coke plant at Granite City, Ill., which are operated by Koppers as an agent for Missouri-Illinois. In the future the facility will be known as the Missouri-Illinois plant of Koppers' Gas & Coke Division. Formed in October, 1947, Missouri-Illinois was the successful bidder for the Granite City property, then owned by the government.



## Paragraph mentions of developments of interest and significance within the metalworking industry

**Cincinnati Milling Machine Co.**, Cincinnati, has acquired control of Carlisle Chemical Works Inc., Reading, O. Management and operations of the chemical plant will be continued.

**Vonnegut Moulder Corp.**, Indianapolis, has sold its woodworking machine division to G. M. Diehl Machine Works Inc., Wabash, Ind., manufacturer of woodworking machinery. Vonnegut will concentrate on production of Marschke grinders and buffers.

**General Electric X-Ray Corp.**, Milwaukee, a GE subsidiary, reports that Victor X-Ray Corp. of Canada Ltd., a Canadian affiliate, has changed its name to General Electric X-Ray Corp. Ltd.

**E. A. Stevens Level Co.**, Newton Falls, O., maker of wood and metal levels, has appointed the following sales agents: Warren L. Baldwin, Cleveland, for Ohio and Michigan; Earl H. Ebert Co., Kansas City, Mo., for Kansas, Nebraska, Missouri and Iowa; Higgings & Linde Inc., Chicago for Illinois, Indiana, Wisconsin, Minnesota and Louisville, Ky.

**Glyco Products Co. Inc.**, producer of emulsifiers and stabilizers used in the metal, rubber, lubricant and other industries, has moved its Brooklyn, N. Y., manufacturing and research facilities to Natrium, W. Va., the company's main plant.

**Penowa Coal Co.**, Pittsburgh, spent nearly \$1 million in 1948 on new equipment to boost production to 750,000 tons of deep and strip mine coal during the year, a new record.

**U. S. Pipe & Foundry Co.**, Burlington, N. J., producer of cast iron pressure pipe, is this month observing its 50th anniversary.

**Stoker Manufacturers' Association**, Chicago, reports that factory sales of mechanical and automatic coal stokers for 1948 totaled 85,378 units, compared with 68,908 units in 1947 and 190,918 in 1946.

**Bell & Howell Co.**, Chicago, maker of motion picture equipment, has entered the film manufacturing industry with purchase for \$325,000 of the plants and equipment of Kryptar

Corp., Rochester, N. Y., to be used to produce microfilm for Bell & Howell microfilm equipment.

**Lea Mfg. Co. of Canada Ltd.** has been formed at 370 Victoria St., Toronto, Ont., to manufacture and distribute polishing, buffing and burning compositions. Dr. Henry L. Kellner is company president.

**Enameled Metals Co.**, Pittsburgh, manufacturer of conduit and fittings, has appointed Hemphill & Co., Detroit, as sales representative for Michigan.

**International Detrola Corp.**, New York, reports its stockholders have voted to change its name to Newport Steel Corp. (STEEL, Feb. 28, p. 64).

### INCREASING OUTPUT

**BOIARDI Steel Corp.**, Milton, Pa., will place its second 15-ton electric furnace in operation in about 30 days. Its first furnace went in on Dec. 5. The two furnaces will have combined capacity of 80,000 tons annually.

The company, which acquired the facilities of the former Milton Mfg. Co. and purchased a rolling mill from the St. Louis Screw & Bolt Co., has annual capacity for the production of 80,000 tons of bars and small shapes annually.

**E. I. du Pont de Nemours & Co.**, Wilmington, Del., has become the 17th large industry to join University of Chicago's \$12 million basic atomic and metal research program. Du Pont will pay \$100,000 for a five-year membership in the Institute of Metals, one of three institutes in the peacetime research program established by Chicago two years ago.

**Hamilton Pump Co. Inc.**, Pittsburgh, designer and builder of special machinery, announces the formation of Hamilton Surface Grinders Ltd., P.O. Box 77, Sheffield, England, to make Hamilton grinding and finishing machines for sale in Europe.

**Wagner Awning & Mfg. Co.**, Cleveland, maker of industrial canvas products and home awnings, has been

sold to 100 of the firm's 425 employees. J. Roy Fink is the new president.

**Amgears Inc.**, Chicago, manufacturer of production and precision gears, has appointed Vee Mac Co., Rockford, Ill., as a representative in Illinois and Allied Transmission Equipment Co., Kansas City, Mo., as an agent in Missouri.

**Pressed Metal Institute** has moved to 13210 Shaker Sq., Cleveland.

**Aviation Maintenance Corp.**, Van Nuys, Calif., has consolidated its manufacturing operations and is leasing some excess work area.

**Anker-Holth Mfg. Co.**, Port Huron, Mich., has appointed Elmer W. Pfel Inc., Cleveland, as distributor in the Cleveland and Pittsburgh territories of its line of pneumatic and hydraulic equipment, including air and hydraulic cylinders, air chucks and collets.

**Rheem Mfg. Co.**, San Francisco, has concluded its manufacturing activities in Birmingham after a tapering-off period covering several months. Although manufacturing activities have been abandoned because of the inability of the territory to absorb the output, warehousing facilities will be maintained indefinitely.

**War Assets Administration** announces Electro-Motive Division, General Motors Corp., Detroit, will exercise its option to purchase plant facilities at 900 E. 103rd St., Chicago. Property, consisting of a main building with about 540,000 sq ft of area and seven smaller buildings totaling more than 128,000 sq ft, is being purchased for \$1,660,825.

**Westinghouse Electric Corp.** has purchased a 146-acre former airport on the outskirts of Pittsburgh as a site for its new atomic power division which will design and build an atomic power plant to propel naval vessels. New construction work will be completed in 1949 at the property.

**Duro-Test Corp.**, North Bergen, N. J., announces appointment of Patterson Electric Ltd., Toronto, Ont., as distributor in Canada for all its lighting products.

**George Gorton Machine Co.**, Racine, Wis., received the 1948 Labor Relations Institute first place award for outstanding achievement in industrial relations.



# The Business Trend

**FOLLOWING** a two-week leveling-off period, industrial activity as reflected by STEEL's industrial production index climbed 1 point in the week ended Feb. 26 and reached 172 per cent (preliminary) of the 1936-1939 average. The current level is 4 points higher than for the same week a year ago and the same as one month ago.

**AUTOMOBILES**—Further gains in production of passenger cars and trucks during the week ended Feb. 26 brought the industry's output to 116,176 units and resulted in part of the rise in industrial activity. Despite this good showing by the industry, the gain was held down to 1971 units over the preceding week by suspension of production in several passenger car lines. Slowness in sales, model changeovers and parts shortages were the reasons given for the several shut-downs.

**STEEL**—Although capacity operations by the nation's steelmakers are becoming routine, they have been a major factor in sustaining industrial activity at high levels for many weeks. Production of steel for ingots and castings was again at 100 per cent of capacity in the week ended Feb. 26, marking the fourth consecutive week of operations at this rate. Although the monthly average of operations for February will be higher than in January, tonnage figures will be lower because of the shorter month.

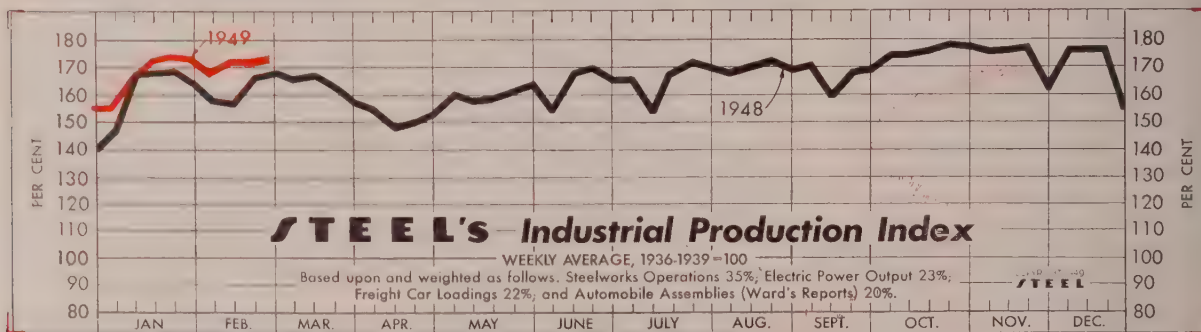
**GROSS NATIONAL PRODUCT**—Department of Commerce reports that the gross national product in 1948 was \$255 billion, 10 per cent above 1947. Gross

national product measures the market value of goods and services produced by the nation's economy and consists of purchases by consumers and government, net foreign investment and gross private domestic investment. In 1948, purchases by consumers and foreign customers were smaller than in 1947. Private domestic investment plus government purchases, whose share increased, became the chief dynamic factors in business expansion.

**INCOME**—National income reached a total of \$224.6 billion in 1948, according to the Commerce Department. Percentage shares earned by employees, corporate and noncorporate enterprises and personal lenders and landlords showed no marked change from the previous year. Payrolls were higher in the second half of 1948 than in the first, but some decline appeared in the last quarter. Corporation profits, adjusted for inventory valuation, were about 20 per cent above 1947 levels.

**CONSTRUCTION**—Civil engineering construction volume for the four-day week ended Feb. 24 totaled \$75.6 million, 49 per cent below the volume for the preceding five-day week. The cumulative total for the first eight weeks of 1949, however, is 38 per cent above the corresponding total a year ago.

**PRICES**—The wholesale price index of the Bureau of Labor Statistics for the week ended Feb. 22 remained unchanged from the preceding week at 158.5 per cent of the 1926 average. This level is 0.9 per cent lower than in the corresponding week of 1948.



Index (chart above): Week ended Feb. 26 (preliminary) 172 Previous Week 171 Month Ago 172 Year Ago 168

## BAROMETERS of BUSINESS

### INDUSTRY

	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	100.0	100.0	99.5	93.5
Electric Power Distributed (million kilowatt hours)	5,559	5,650	5,810	5,250
Bituminous Coal Production (daily av.—1000 tons)	1,800	1,907	1,903	2,150
Petroleum Production (daily av.—1000 bbl)	5,344	5,361	5,439	5,380
Construction Volume (ENR—Unit \$1,000,000)	\$75.6	\$146.6	\$212.2	\$128.5
Automobile and Truck Output (Ward's—number units)	116,176	114,207	116,471	120,130

\* Dates on request. † 1949 weekly capacity is 1,843,516 net tons. 1948 weekly capacity was 1,802,476 net tons.

### TRADE

Freight Carloadings (unit—1000 cars)	715†	697	679	790
Business Failures (Dun & Bradstreet, number)	180	180	136	95
Money in Circulation (in millions of dollars)‡	\$27,551	\$27,480	\$27,561	\$28,054
Department Store Sales (changes from like wk. a yr. ago)‡	—8%	none	+1%	+15%

† Preliminary. ‡ Federal Reserve Board.

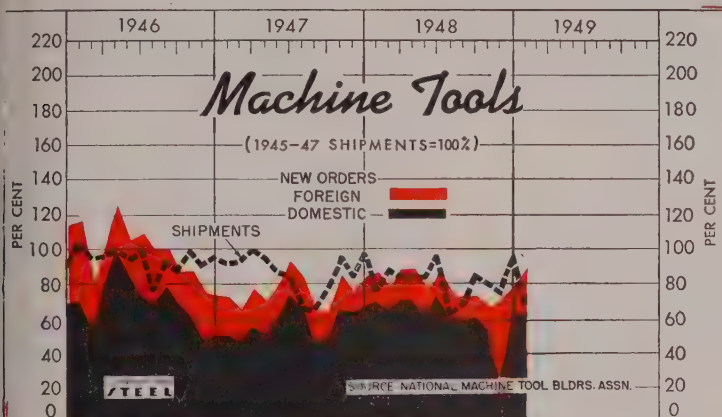
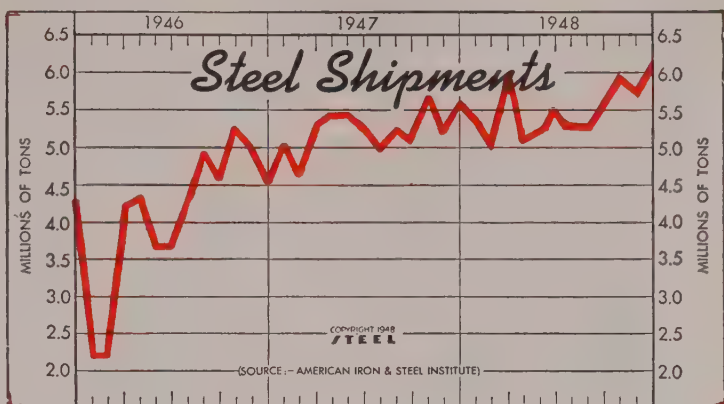


## Steel Shipments

(Net Tons)

	1948	1947	1946
Jan. ....	5,410,438	5,061,333	2,189,369*
Feb. ....	5,046,115	4,626,424	2,189,368*
Mar. ....	5,978,551	5,304,415	4,213,913
Apr. ....	5,096,161	5,445,993	4,335,694
May ....	5,321,375	5,442,343	3,666,677
June ....	5,476,774	5,263,711	3,687,509
July ....	5,229,880	4,974,566	4,259,494
Aug. ....	5,329,060	5,278,223	4,965,456
Sept. ....	5,511,474	5,118,839	4,589,902
Oct. ....	5,952,008	5,681,597	5,260,832
Nov. ....	5,732,256	5,216,990	5,019,984
Dec. ....	6,056,282	5,613,036	4,533,420

\* Figures for January and February, 1946, are merely averages derived from a report that combined shipments for those two strike-affected months into a total of 4,378,737.



## Machine Tools (1945-1947 Shipments = 100)

	Orders				Shipments	
	Total	Domestic	1949	1948	1949	1948
Jan. ....	87.1	83.1	65.2	69.1	68.8	75.3
Feb. ....	77.3	...	64.6	...	...	87.1
Mar. ....	86.3	...	70.2	...	...	83.6
Apr. ....	86.3	...	72.2	...	...	82.0
May ....	73.5	...	62.1	...	...	82.6
June ....	83.4	...	71.5	...	...	94.4
July ....	74.0	...	61.1	...	...	62.4
Aug. ....	73.7	...	60.9	...	...	69.8
Sept. ....	73.1	...	61.5	...	...	84.7
Oct. ....	67.4	...	53.4	...	...	80.4
Nov. ....	72.2	...	54.1	...	...	76.2
Dec. ....	76.7	...	60.5	...	...	96.9

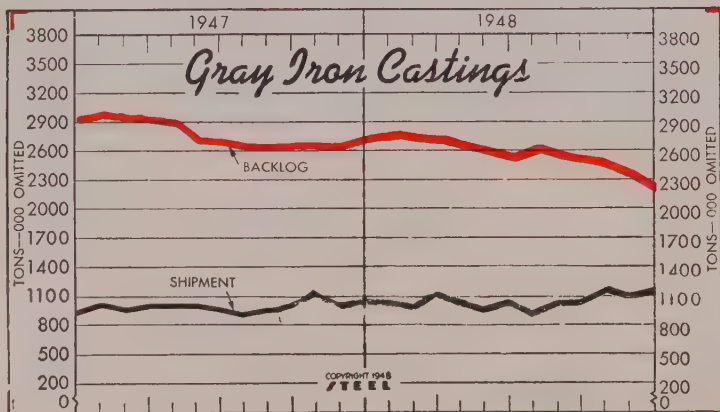
## Gray Iron Castings

(U. S. Bureau of Census)

Tons—000 omitted

	Shipments		Backlogs*	
	1948	1947	1948	1947
Jan. ....	1,064	1,078	2,803	3,021
Feb. ....	1,024	1,010	2,769	2,987
Mar. ....	1,169	1,090	2,726	2,979
Apr. ....	1,051	1,097	2,691	2,909
May ....	993	1,097	2,602	2,783
June ....	1,072	1,038	2,587	2,711
July ....	914	913	2,601	2,657
Aug. ....	1,051	952	2,599	2,631
Sept. ....	1,088	1,025	2,587	2,680
Oct. ....	1,148	1,154	2,523	2,669
Nov. ....	1,100	1,020	2,407	2,687
Dec. ....	1,111	1,066	2,284	2,782
Total .....	12,786	12,541		

\* Unfilled orders for sale to the trade.



## FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions) .....	\$11,423	\$12,711	\$13,907	\$11,788
Federal Gross Debt (billions) .....	\$252.6	\$252.6	\$252.4	\$254.7
Bond Volume, NYSE (millions) .....	\$14.8	\$14.4	\$17.0	\$15.6
Stocks Sales, NYSE (thousands) .....	3,427	3,908	4,681	3,092
Loans and Investments (billions)† .....	\$62.0	\$62.2	\$62.9	\$64.3
United States Gov't. Obligations Held (millions)† .....	\$32,909	\$33,016	\$33,749	\$36,634

† Member banks, Federal Reserve System.

## PRICES

STEEL's Composite Finished Steel Price Average .....	\$97.77	\$97.77	\$97.77	\$81.14
STEEL's Nonferrous Metal Composite‡ .....	232.6	232.6	232.6	189.5
All Commodities† .....	158.5	158.5	158.8	159.9
Metals and Metal Products† .....	178.1	178.1	177.9	155.6

† Bureau of Labor Statistics Index, 1926=100. ‡ 1936-1939=100.



# Men of Industry



R. G. NEILSON

**R. G. Neilson** has been named general manager of production and manufacturing for Mackintosh-Hemp-hill Co., Pittsburgh, and will super-vise production and manufacturing operations in the Midland, Pa., plant and in the Garrison plant in Pitts-burgh.

—o—

**M. S. Downes** has been appointed general sales manager of the Rail-way Division, Timken Roller Bear-ing Co., Canton, O., succeeding the late **W. C. Sanders**, under whom he had been assistant general sales manager for the past 20 years. **J. E. McCort**, formerly district manager, Railway Sales Division in Cleveland, was made assistant general sales manager of the division. **Ralph G. Harmon**, formerly a sales engineer in the Chicago office, has become dis-trict manager of the Industrial and Steel & Tube Divisions in Birming-ham, succeeding **F. B. Carney**, re-signed.

—o—

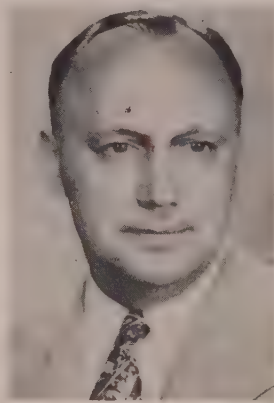
**W. J. Primrose** has been elected pres-ident of Dickey-Grabler Co., Cleve-land. He has been with the com-pany since 1923, and served as vice president and director for the last 12 years.

—o—

Nicholson File Co., Providence, R. I., announces appointment of **Edmond A. Neal** as assistant director of sales. Associated with the company since 1939 in various capacities, Mr. Neal, in 1946, became assistant to **H. L. Whitney**, director of sales, in market analysis and sales management.

—o—

**A. M. Tredwell Jr.** has been made assistant to the president and director of personnel, Sharon Steel Corp.,



ALWIN F. FRANZ

Sharon, Pa. He started with the company in 1930 and has served in various capacities in industrial en-gineering, industrial relations, per-sonnel work and other activities. He will continue to serve as head of in-dustrial relations, industrial engineer-ing, employment and safety. He will have access to all departments of the company's business and will serve as liaison officer with the sub-sidiaries of the corporation. **J. D. Neuman** has been made assistant vice president and will be connected with raw materials, purchasing, traf-fic, advertising, patents and public relations.

—o—

**Alwin F. Franz** has been appointed executive vice president of Colo-rado Fuel & Iron Corp., Denver, Colo., and its subsidiary companies. Mr. Franz, recently elected to the board of directors, joined the corpo-ration in 1945. He served previous-ly with Alan Wood Steel Co., Con-shohocken, Pa., as general superin-tendent of the Steel Division. He is succeeded by **Jay J. Martin** as vice president in charge of operations for CF&I and subsidiary companies. Mr. Martin has been works manager of the open hearth steel department at Pueblo, Colo. Both Mr. Franz and Mr. Martin will maintain headquar-ters at Pueblo, and Mr. Franz will also have a similar office at Buffalo.

—o—

**H. H. Mosher** has been named man-ager, carbide sales, Detroit district, for Firth Sterling Steel & Carbide Corp., McKeesport, Pa. He was man-ager of the former Firth Sterling Buffalo district.

—o—

Appointment of **Warren S. Marshall**



WILSON W. WHEELER

as manager of railroad sales has been announced by Chicago Stee Service Co., Chicago. **F. C. Kenmer-ling** has been appointed office man-ager of the company.

—o—

Askania Regulator Co., Chicago announces appointment of **Wilson W. Wheeler** as sales manager. He joined the company in 1941 in the sales engineering department, and in 1945 became head of that department. Prior to his association with Askania, Mr. Wheeler was a mechanical engi-neering consultant in Cincinnati.

—o—

**Charles V. Masterson Jr.** has been appointed superintendent of indus-trial relations at the Gary, Ind., sheet and tin mill, Carnegie-Illinois Steel Corp., United States Steel Corp. sub-sidiary. He succeeds **William P. Jones**, transferred to Pittsburgh as supervisor of education and training for Carnegie-Illinois.

—o—

**Richard H. Koehler** has been ap-pointed advertising manager, Stearns Magnetic Mfg. Co., Milwaukee. Formerly advertising manager for Vincent-McCall Co., Kenosha, Wis., Mr. Koehler succeeds **Hugh Sharp**, who has resigned to join Advertising & Publicity Associates, Milwaukee, as account executive.

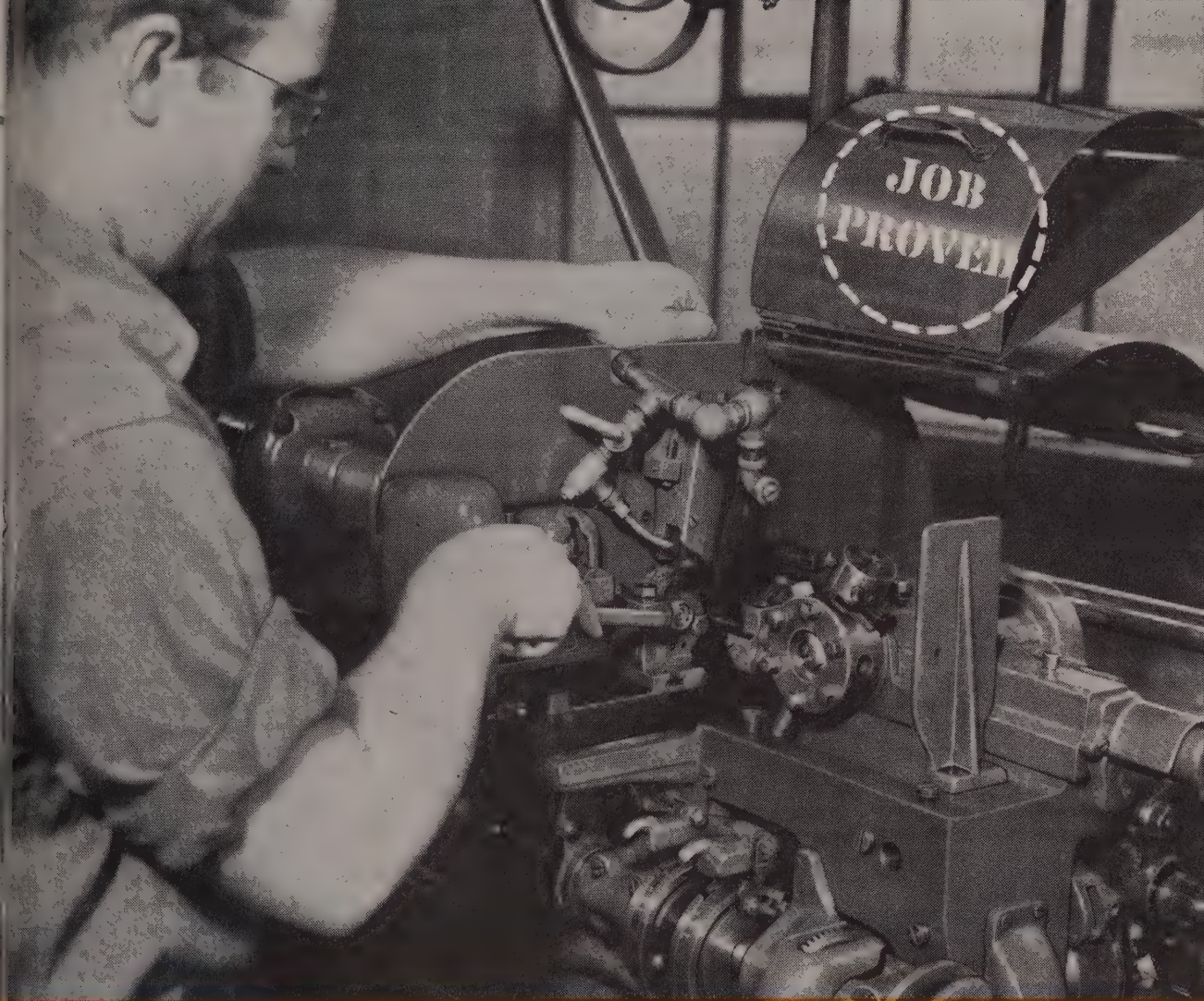
—o—

**Bradley C. Riggins** has been appoint-ed vice president and purchasing agent for Livingstone Engineering Co., Worcester, Mass. He has been a director of the company since its organization, and until recently has served as assistant to the president.

—o—

**Leslie McArthur**, vice president, Niles-Bement-Pond Co., West Hart-





## TOOL LIFE TRIPLED

### Sunicut with Petrofac\* Improves Finishes and Lengthens Tool Life in Intricate Machining Job

In the machining of small parts for radios, a shop was using a dark cutting oil with poor results. Finishes were rough, tool life was unsatisfactory. The dark oil made the work hard to see.

Changing to Sunicut with Petrofac, the plant found the ideal oil for its purpose. Its cooling and lubricating qualities are producing excellent finishes, and increasing

tool life from 10 hours to 30 hours. Further, machinists can see the work better through this transparent oil.

**Job:** Turning, forming, threading, pointing

**Machine:** Brown & Sharpe OOG Automatic

**Part:** Stud pulley for radio

**Material:** B 1112 steel

**Tools:** Rex AA high-speed circular form tools

**Spindle Speed:** 2,600 R.P.M.

**Cutting Speed:** 165 S.F.P.M.

These new grades of Sunicut with

Petrofac are making possible better finishes than ever, and faster work in a wide range of operations. The new Sunicut grades with Petrofac possess superior metal-wetting, anti-weld, and extreme-pressure qualities. They are not blended with animal or vegetable fatty oils—cannot turn rancid. For additional information about the various Sunicut cutting oils, write for folder S-3.

**SUN OIL COMPANY • Philadelphia 3, Pa.**

*In Canada: Sun Oil Company, Ltd.  
Toronto and Montreal*

\*Petrofac is a trademark of Sun Oil Company.

## SUN PETROLEUM PRODUCTS

"JOB PROVED" IN EVERY INDUSTRY





ford, Conn., has been elected a member of the board of directors. He joined Niles in 1947 as manager of the Chandler-Evans division, and became vice president of the firm in 1948. His present duties are concerned with the operation and activities of all N-B-P divisions. From 1934 to 1943 he headed his own accounting firm, and then he joined Underwood Corp. as executive assistant in the manufacture of carbine rifles and other war materiel.

**Eugene B. Mapel**, director of training and education at Carnegie-Illinois Steel Corp., Pittsburgh, has been named vice president in charge of the Sales Consulting Division of Methods Engineering Council, Pittsburgh, management consulting firm.

**Bruce L. Wilson** has been appointed chief of the engineering mechanics section of the National Bureau of Standards, Washington.

Trabon Engineering Corp., Cleveland, announces appointment of **Dudley C. Jackson** as distributor of its line of centralized lubrication equipment in the Chicago area. He has served with the company since 1935 in various capacities, and for the past six years has been service manager. His office will be in Chicago.

**David S. Reynolds** has been appointed New England representative for Gas Machinery Co., Cleveland. He retired in 1947 as vice president and chief engineer, Boston Consolidated Gas Co., with which he had been connected for many years. He has since acted as consultant to several gas companies in New England.

**H. B. Goodwin** has joined the staff of Battelle Memorial Institute, Columbus, O., where he will be en-

gaged in research in metallurgy. He has previously been associated with Bethlehem Steel Co., Crown Cork & Seal Co., and the Kellex Corp.

Establishment of a Research Division in the industrial relations department has been announced by American Steel & Wire Co., Cleveland, subsidiary of United States Steel Corp. The new section will be headed by **C. J. Forbes**, formerly assistant to director of industrial relations.

**Willard F. Rockwell Sr.**, chairman of the board, and his son, **Willard F. Rockwell Jr.**, president, Rockwell Mfg. Co., Pittsburgh, have been elected to the board of directors of Acro Switch Co., Cleveland, formerly Acro Electric Co., manufacturer of rolling spring switches, relays and thermostats. The company was purchased in December by a group from Pittsburgh, headed by the younger Mr. Rockwell. **F. G. McCloskey**, Euclid, O., was named president. In addition to Mr. McCloskey and the Rockwells, other directors are **Arthur F. Kroeger**, New York, and **Frank P. Maxwell**, Columbus, O. **John H. J. Pearce** was appointed sales manager.

**Joseph H. Austin** has been elected to the board of directors, Oneida Ltd., Oneida, N. Y. He is purchasing agent for the company.

**S. J. Mergenhagen** has been appointed assistant sales manager of Heppenstall Co., Pittsburgh, and **R. H. Musser** succeeds him as district sales representative in Philadelphia. Mr. Mergenhagen joined Heppenstall in 1945 after eight years in Erie, Pa., as district sales manager of Brace-Mueller-Huntley Inc., sales agent for Heppenstall die blocks, knives, tongs and other forged products. Mr.

Musser, associated with the company since 1928, has been a member of the Pittsburgh district sales staff for the last several years.

Pittsburgh Steel Products Co., Pittsburgh, announces opening of a district sales office at Dallas, and the appointment of **Gilbert H. Coughlin** as manager; also the opening of its Pacific Coast sales office in San Francisco, which comprises the Los Angeles and San Francisco offices with **James A. Olds** appointed district manager, succeeding **O. C. Fields**, retired. **J. M. McDevitt** is manager of the Los Angeles office. **K. H. Bender** has been appointed sales manager of the tube specialties, Mid-Continent district of Pittsburgh Steel Co., parent company, with headquarters at Tulsa, Okla., and **T. R. Miller** was appointed assistant sales manager there.

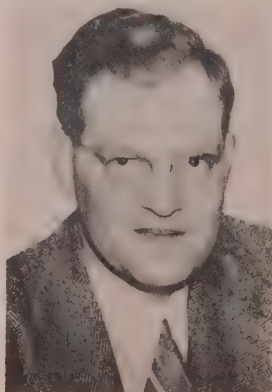
**C. Russell Miller** has been appointed a service engineer working out of the Cincinnati office of Kennametal Inc., Latrobe, Pa. **Henry B. Worthington** was appointed a sales engineer working out of the Springfield, Mass., office, and **Thomas J. Kniff Jr.** as an application engineer out of the Philadelphia office. **L. D. Morton** is acting manager of the New York office, recently moved to 11 W. 42nd St. He is assisted by **Gerald O. Bogner**, **John A. Storrs** and **J. G. Brady**.

**Harry S. Hagan** has been appointed manager of the Butler, Pa., freight car plant of Pullman-Standard Car Mfg. Co., Chicago.

**Barron D. Berger** has been appointed chief engineer, National Electric Welding Machines Co., Bay City, Mich. He was formerly assistant chief engineer in charge of special



DAVID S. REYNOLDS



S. J. MERGENHAGEN



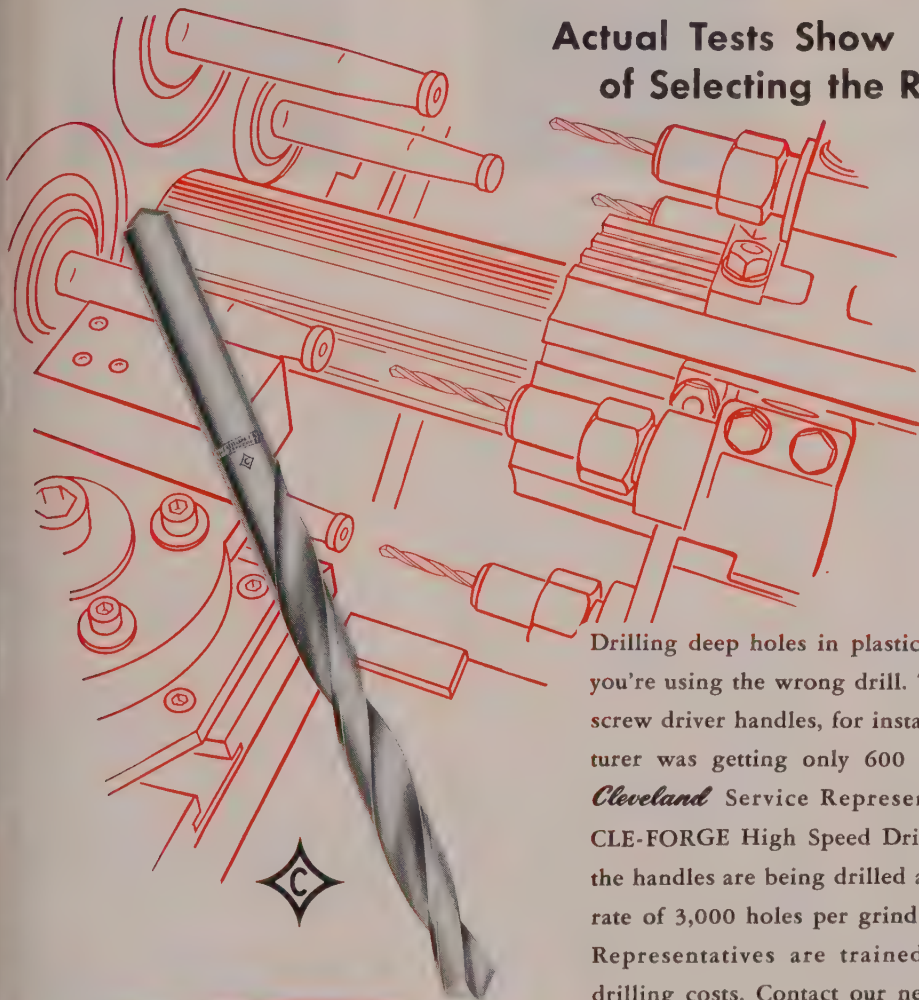
BARRON D. BERGER



# Here's a Tip

## On DRILLING PLASTICS

Actual Tests Show Importance  
of Selecting the Right Drill



Drilling deep holes in plastic can be a problem . . . if you're using the wrong drill. Take these nitro-cellulose screw driver handles, for instance. An eastern manufacturer was getting only 600 holes per grind, until a *Cleveland* Service Representative ran a test on the CLE-FORGE High Speed Drill shown at the left. Now the handles are being drilled at the almost unbelievable rate of 3,000 holes per grind! ♦ *Cleveland* Service Representatives are trained to help you cut your drilling costs. Contact our nearest Stockroom, or . . .

Telephone Your Industrial Supply Distributor

### THE CLEVELAND TWIST DRILL CO.

1242 East 49th Street

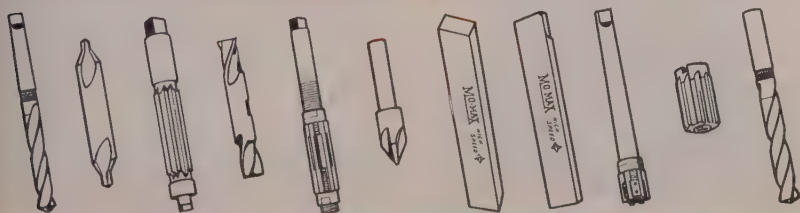
Cleveland 14, Ohio

Stockrooms: New York 7 • Detroit 2 • Chicago 6 • Dallas 1 • San Francisco 5

Los Angeles 11 • London W. 3, England



ASK YOUR INDUSTRIAL SUPPLY DISTRIBUTOR FOR THESE AND OTHER CLEVELAND TOOLS



*Cleveland* Distributors everywhere  
are ready to serve you!



machine design at Federal Machine & Welder Co., Warren, O., and also served as engineering assistant to the vice president and general manager of the Welding Division of that company.

—o—  
**Roland C. Disney** has resigned as vice president and general manager, Whitcomb Locomotive Co., Pittsburgh, to become effective Mar. 15 when he will be succeeded by **Charles K. Olson** as general manager of the company.

—o—  
**C. W. Floyd Coffin** has been elected vice chairman of the board of American Arch Co. Inc., New York, succeeding **B. A. Clements**, retired. New directors elected were **Frederick A. Schaff**, chairman of the board of Combustion Engineering-Superheater Inc.; **Arthur F. Becker**, vice president, American Arch Co.; and **Roger L. Wensley**, president, G. M. Basford Co.

—o—  
**Robert A. Stauffer** has been elected vice president and director of research, National Research Corp., Cambridge, Mass. He has been associated with the company since 1942.

—o—  
**Medley G. B. Whelpley** has been elected a director of Warren Foundry & Pipe Corp., New York, filling a vacancy created by the death of **J. Leonard Replogle** last November.

—o—  
**W. B. Osgood** has become a partner in Dunbar Engineering Co., New York, representing Edward Valves Inc., East Chicago, Ind. After graduating from the University of Wisconsin, Mr. Osgood served as sales agent for Globe Steel Tubes Co. and later as sales representative for Pittsburgh Steel Co. Since 1938 he has been sales representative, assistant manager of sales, and finally district representative for National Tube Co.

—o—  
**Link-Belt Co.**, Chicago, announces that **J. H. Oakes** has been appointed sales manager, enclosed drives, with headquarters at the Philadelphia plant, and that he will be assisted by **Harry F. Kurz** as representative, enclosed drives, with headquarters at the Pershing Rd. plant in Chicago.

—o—  
**John R. Lewis** has been appointed by Quaker Rubber Corp., Philadelphia, to be in charge of a territory which includes the greater part of eastern United States.

—o—  
**Alexander L. Feild**, Rustless Division,



E. A. WARNER

Baltimore, Armco Steel Corp., has been honored for his achievements in the field of science by Stevens Institute of Technology, which conferred on him an honorary degree of Doctor of Science.

—o—  
**E. A. Warner** has been appointed district manager of the New York office, Union Switch & Signal Co., Swissvale, Pa. Associated with the company since 1917, he became office manager at New York in 1930.

—o—  
**Dr. William Hume-Rothery** has been awarded a medal by the Institute of Metals, London, England, in recognition of his contributions to the science of nonferrous metallurgy.

—o—  
**Clifford W. Macfarlane** has been appointed Pacific divisional merchandising manager for Hudson Motor Car Co., Detroit. Prior to wartime service with the War Department, Bureau of Public Relations, he was director of public relations for Hudson at Detroit. In his new position. Mr. Macfarlane will make his headquarters in Los Angeles.

—o—  
**Ralph H. Tapscott**, president, Consolidated Edison Co. of New York, since 1937, has been elected to the newly created post of chairman of the board. He continues as chief executive officer of the company, and is succeeded as president by **Hudson R. Fearing**, executive vice president. **Harland C. Forbes**, a vice president, was elected executive vice president.

—o—  
Changes in personnel at Mathieson Chemical Corp., New York, includes transfer of **Roland F. Boehm** from district sales manager of the Houston, Tex., office, to the ammonia department, with headquarters in New York; **O. J. Theobald Jr.**, formerly



DONALD SHERWOOD

district sales manager of the Charlotte, N. C., office, succeeds Mr. Boehm at Houston; **J. F. Carey**, formerly a sales representative in the Charlotte territory, has been named district sales manager of the Charlotte office.

—o—  
**Donald Sherwood** has been appointed district manager of the newly established Pittsburgh office of H. M. Harper Co., manufacturer of nonferrous and stainless steel nut and bolt products. He was formerly located at the Cleveland branch office.

—o—  
**Paul W. Dillon**, president, Northwestern Steel & Wire Co., Sterling, Ill., has been elected a director of Illinois Manufacturers' Association for the current year.

—o—  
**Dr. Henry O. Farr** has been appointed production and technical director of Murphy Paint Co. Ltd., a Canadian affiliate of Pittsburgh Plate Glass Co., Pittsburgh.

—o—  
**Braden T. Woodside** has been promoted to superintendent of the Cambria, Pa., Works of Harbison-Walker Refractories Co., Pittsburgh.

—o—  
**Robert P. Kenney**, formerly manager of international sales department, B. F. Goodrich Chemical Co., Cleveland, has been appointed manager of chemical sales, succeeding **S. L. Brous**, resigned to accept a position with General Electric Co. Mr. Kenney is succeeded by **James C. Richards Jr.**, formerly sales manager of Hycar American Rubber and rubber chemicals. **W. D. Parrish**, formerly technical service manager for Hycar and rubber chemicals, becomes the new sales manager of that department, and is succeeded by **Roger C. Bascom**, Hycar sales representative in the New England terri-



LYLE H. HARVEY

Elected executive vice president and general manager, Parsons Corp., Detroit. Noted in STEEL, Feb. 28 issue, p. 70



RAY S. LARSEN

Who has been appointed sales manager, Despatch Oven Co., Minneapolis. Noted in STEEL, Feb. 28 issue, p. 68



JAMES W. MURRAY

Elected president and director, Murray Steel Supply Corp., New York. Noted in STEEL, Feb. 28 issue, p. 73

tory. **Roger S. Steller** has been appointed to succeed Mr. Bascom in New England.

—o—

**Frank T. Sisco**, director of Alloys of Iron Research, has been appointed

technical director of the Engineering Foundation, New York, which is a joint research agency of American Society of Civil Engineers, American Institute of Mining & Metallurgical Engineers, American Society of Mech-

anical Engineers, and American Institute of Electrical Engineers. Mr. Sisco, who has been in charge of Alloys of Iron Research since 1930, for the present continues with this project in addition to his new duties.

## OBITUARIES . . .

**Col. George A. Green**, 66, former vice president in charge of engineering, General Motors Corp., Detroit, and a Paris representative of the Economic Cooperation Administration, died in Miami Beach, Fla., Feb. 21.

—o—

**Charles O'Neill**, 61, president of United Eastern Coal Sales Corp. and the Central Pennsylvania Coal Producers Association, died Feb. 28 at New Rochelle, N. Y., after a week's illness. He was spokesman for the soft coal producers in wage and other industry negotiations.

—o—

**Harry S. Richardson**, 70, formerly control engineer with Electric Controller & Mfg. Co., Cleveland, died Feb. 25. He retired last October after 45 years of association with the company.

—o—

**H. S. Robertson**, 55, vice president and director, Harbison-Walker Refractories Co., Pittsburgh, died Feb. 21 while vacationing in Guatemala.

—o—

**Thomas W. Delanty**, 57, president, Chicago Steel Structures Co., Chicago, and vice president, Apex Railway Products Co., which he helped organize, died Feb. 26 of a heart attack.

—o—

**Winfred W. Elliott**, founder, Elliott Mfg. Co., Binghamton, N. Y., died Jan. 26. Active in the flexible shaft industry since 1898, Mr. Elliott was

partner in the Binghamton Flexible Shaft Co. from 1920 to 1931, when he sold out to establish the present company in 1932. He had been inactive during 1948, due to ill health, and last July sold his interest to remaining partners, his son, Boyd W. Elliott, and son-in-law, Wilbur J. Kupfrian.

—o—

**Alvin B. Einig**, 64, general manager and director, Motch & Merryweather Machinery Co., Cleveland, died Feb. 27 of a heart ailment from which he had been suffering for several months. During World War II Mr. Einig was administrative officer of the Tools Division, War Production Board, Washington, and as a result of wartime service, was appointed the machine tool expert on the United States Reparations Mission (the

Pauley Mission) which made a world flight May-September, 1947, studying conditions in the Far East, Europe and elsewhere for the State Department. Mr. Einig served two terms (1945-1946) as president of American Machine Tool Distributors' Association, and was a member of other technical societies.

—o—

**Henry R. DeGroat**, 74, prominent in scrap circles in Philadelphia, died recently. He retired several years ago from A. M. Wood & Co., Philadelphia, with which he had long been associated.

—o—

**George S. Pierson**, 77, retired general sales manager, Austin Machinery Co., Muskegon, Mich., died recently.

—o—

**Howard C. Rudisill**, 62, superintendent of the Strobe Ave. plant of By-Products Steel Co., division of Lukens Steel Co., Coatesville, Pa., died of a heart attack Feb. 24 while vacationing in St. Petersburg, Fla. He had been associated with Lukens since 1926.

—o—

**Gilbert L. Church**, 69, for more than 30 years assistant treasurer, Brown & Sharpe Mfg. Co., Providence, R. I., died Feb. 27.

—o—

**Samuel N. Summer**, 64, president, Summer & Co., Columbus, O., and president, West Virginia Steel & Mfg. Co., Huntington, W. Va., manufacturer of steel products, died Feb. 27 in Phoenix, Ariz.



ALVIN B. EINIG



# Experienced men make better chain ... and serve you better!

**T**HE Cleveland Chain organization, now in its 80th year, throughout its history has been continuously and actively operated by practical chain men.

Company executives, without exception, are men who have "grown up" in the chain business. Their knowledge, experience and skill is reflected in every length of Cleveland Chain.

To these men the production of fine chain is more than a business. It is a tradition to be upheld . . . a reputation to be carefully guarded . . . a recognized responsibility which guarantees that customers will find security and satisfaction in every Cleveland product.

## **CLEVELAND CHAIN**

***The Cleveland Chain & Mfg. Co.***

*Cleveland 5, Ohio*

Associate Companies: David Round & Son, Cleveland 5, Ohio. • The Bridgeport Chain & Mfg. Co., Bridgeport 1, Conn. • Seattle Chain & Mfg. Co., Seattle 8, Wash. • Round California Chain Co., So. San Francisco and Los Angeles 54, California • Woodhouse Chain Works, Trenton 7, N. J.

Since **DR** 1869



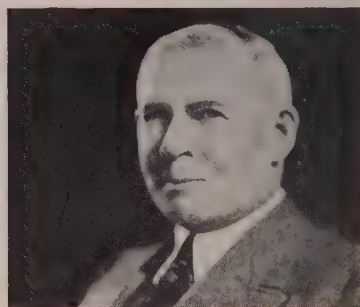
Louis D. Cull, chairman of the board and general manager. 48 years with Cleveland Chain.



Raymond L. Round, president. 40 years with Cleveland Chain.



Thornton E. Round, secretary and treasurer. 38 years with Cleveland Chain.



David J. Gemmell, vice president in charge of sales. 30 years in the chain industry, 20 years with Cleveland Chain.

*Security In Every Link*



**VACUUM TUBE CHALLENGER**—A unit that presents the first real challenge to the vacuum tube since its introduction nearly 40 years ago, was revealed recently by scientists of Bell Telephone Laboratories. It is a new and improved type of Transistor which promises to be more stable and efficient, capable of handling greater amounts of power than the type originally designed. Development is reported to have many significant potentialities for both telephony and electronics in general. It can perform most key jobs now done by vacuum tubes. It also operates without vacuum, having no filament to cause warm-up delay.

**SUPPLIES MORE OXYGEN**—More than 5 million cubic feet of oxygen per month will be supplied by a \$150,000 oxygen-producing unit soon to be placed in operation by Burdett Oxygen Co., Cleveland. The installation is the largest unit ever built by the company in its 25-year existence. Besides oxygen, the unit also will produce nitrogen and argon gas.

**MADE TO STICK**—Adhesion value of a synthetic finish recently developed by Metric Lacquer Mfg. Co. Inc., Irvington, N. J., is so high that it sticks to highly polished brass, stainless steel, aluminum and other surfaces ordinarily adhesion-resistant to organic coatings. Furthermore, it is flexible enough to withstand 180-degree bends without cracking or flaking. According to the company, the hard, smooth, uniform surface provided by the finish also has a high resistance to chemicals and solvents and some resistance to abrasion. Product, which also can be used on phenolic plastics with longer bake periods, is being made in many colors.

**“—MOTHER OF INVENTION”—**In exploring possibilities of substituting for, or omitting traditional materials and practices to lower cost of distribution, utility companies are coming up with some unusual answers. For example, during the winter meeting of the American Institute of Electrical Engineers in New York recently, it was revealed that one of the western companies had successfully used as a secondary conductor aluminum wire with or without steel reinforcing. It also was reported that bare conductors provide better performance by virtue of less weight, less resistance to wind and less accumulation of glaze.

**LOW-COST WIRE-DRAWING TECHNIQUE**—Entirely new technique of drawing stainless steel wire, developed by Magnus Chemical Co. Inc., Garwood, N. J., is reported to make it possible to draw the metal continuously without lead—from No. 5 rod down to the finest sizes—and at a production cost no higher than that for carbon wire. Process also is said to provide a bright, satin-smooth finish on the product.

**ATOMIC CLOCK**—An atomic clock based on a constant natural frequency associated with the vibration of the atoms in the ammonia molecule is reported by National Bureau of Standards, Washington. It promises to surpass by one or two orders of magnitude the accuracy of the present primary standard, the rotating earth. Theoretical considerations indicate a potential accuracy of one part in billion or even 10 billion, depending on type of atomic system and spectrum used. Development is expected to benefit greatly the communications industries and the military services.

**TOUGHER CORES**—In discussing some of the economic advantages of the carbon correction process in connection with steel bars, J. D. Armour of Republic's Union Drawn Steel Division, points out that the method not only enables a user to hold the surface carbon to the same content as the core, but to increase it slightly above that of the core. On work where high wear resistance is required, a bar can be ground to finished size and the desired carbon content at the surface, and slightly below, can be obtained following induction hardening. Such a treatment provides a bar with wear resistance comparable to a carburized part, but possessing a core that is tougher. (p.106)

**FITTED FIXTURES**—Fixtures used to broach several types of precisely-shaped steel components required in Buick's Dynaflo transmission are designed to fit each piece, holding it rigidly and accurately in relation to the cutting tools. Basic production engineering idea underlying the whole machining setup is that while one piece is being broached, a second—either a duplicate piece or one of the other pieces—is being loaded. Broaching cycle is timed so operator is loading fixtures alternately. (p. 110)

**ACHILLES' HEEL**—Although general time study procedure has become fairly standardized as to forms, element breakdown and methods of watch reading, the practice still has one Achilles' heel—operator rating. According to Ralph H. Stearns, General Motors Institute, Flint, Mich., the diversity of opinions encountered and problems created by this weak point prompted him to prepare an analysis of methods of comparing an operator's performance to the time study observer's concept of normal. (p.115)

**TOOL STEEL PROBLEM**—A problem always hanging over the tool steelmaker's head is decarburization. To avoid it during heating operations he must see that an atmosphere which is neutral to the particular carbon content of the steel surrounds the latter during the time it is above red heat. Several methods are currently in use. Perhaps the shortest is the one referred to as isothermal annealing. (p. 118)

[illegible]



# Carbon Correction

## FOR STEEL BARS

*Maintenance or increase of surface carbon obtainable with corrected bars, frequently provides adequate wear resistance and acceptable core toughness, at the same time eliminating subsequent machining operations*

NOW that the carbon correction process has been successfully applied to the various forms and sizes of annealed bars produced by our company during the past several years, an appraisal of the process and of the applications where it can be most economically used becomes possible. It has become evident that the uses for the carbon restored bars are more extensive than originally contemplated.

When the first article on the subject of carbon correction for steel bars was published<sup>1</sup>, it was shown how various screw machine operations could be improved if the carbon restored bars were used. Because the "skin" of the material possessed the same carbon content as the rest of the bar, finishing operations on the original surface could be eliminated in many cases if the bar size was corrected for the finished part. Machinability of the skin was improved and wear on cutting tools was reduced.

Otherwise, with steel annealed for best machining in older type furnaces, 1/32-inch or more of part's surface had to be removed if surface decarburization was to be eliminated. On parts machined from hexagon, square or irregular shaped stock, this amount of surface removal is expensive and often impracticable. As a result, under-critical annealing treatments were used to avoid decarburization, thus producing poor machining qualities. Examples of results obtained with AISI (SAE) 4150, 52100, 8740, and 9430 steels were then included.

**Application Extended**—The more extensive application of the carbon correction process in an effort to meet increased demands, and to extend it to more types of steels, has resulted in the installation of additional and improved furnace equipment in the past few years. The original installation consisted of one Surface Combustion radiant tube carbottom type furnace. Two of the same make have since been ad-



Fig. 1—(a) Photomicrograph (X100) of AISI (SAE) C-1046 steel in hot rolled condition before receiving carbon correction treatment. Notice extensive depletion of carbon from surface well into core of the material. (b) Photomicrograph (X100) of sample of same AISI C-1046 steel after receiving correction treatment. Notice complete uniformity of surface structure with core

ded, as shown in Fig. 3. In addition, the original Char-Mo atmosphere generator has been replaced by an NX gas unit capable of supplying all gas required for the three furnaces. A duplicate installation of three furnaces has also been added at one of our other plants.

With the carbottom type of furnace, the entire upper portion, as well as the lower section, carries radiant tubes as shown in Fig. 2. This portion is actually a cover over a movable lower section or

1. "Annealing Bars for Use in Automatics", J. D. Armour, *Screw Machine Engineering*, July, 1945.

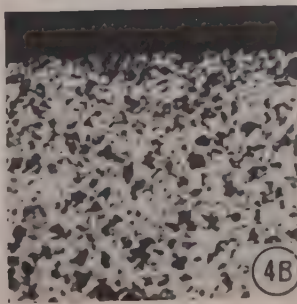
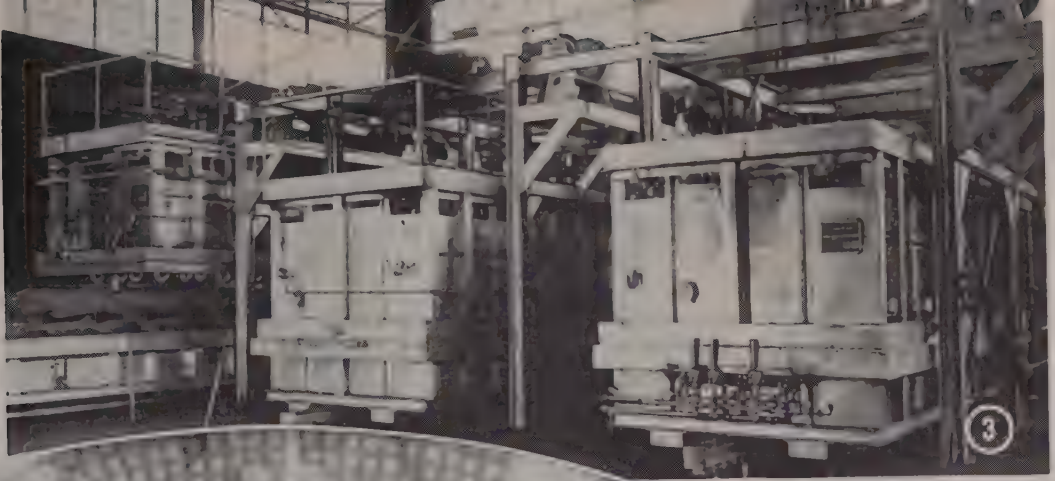


Fig. 2—Interior of radiant tube carbottom type SC furnace with cover raised. Notice radiant tubes in cover and closely spaced rails for supporting charge in furnace

Fig. 3—Three radiant tube carbottom type prepared atmosphere furnaces

Fig. 4—(a) Photomicrograph (X100) of C-1035 hot rolled steel before receiving correction treatment. (b) Same steel after surface is corrected



"car" which can be rolled out from under the cover for loading and unloading, as shown in Fig. 6. The cover fits into the sand seal on the car, so that the usual cold area around the door of conventional furnaces is eliminated. Bars are racked on closely spaced transverse rails as shown in both Figs. 2 and 6. Ease of loading and unloading a furnace of this type is obvious.

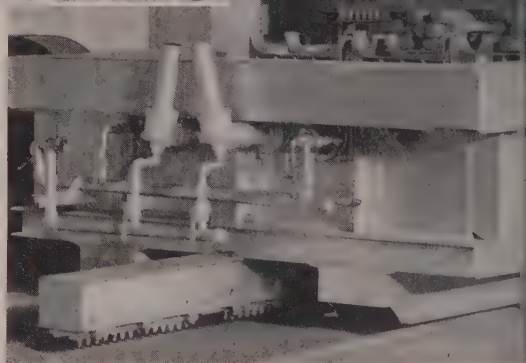
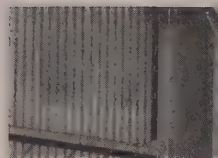
Gas surrounding the bars is a nitrogen or NX type, slightly enriched with about 3 to 5 per cent natural gas or 30 to 40 cubic feet per 1000 cubic feet of NX gas to obtain the desired carbon potential, either to prevent carbon depletion of the surface, or to add carbon as noted later.

**Temperature Control**—Temperature control equipment contributes to the quality of the product. It not only can maintain the desired furnace temperatures, but also can automatically raise or lower the temperature at any desired rate in accordance with the program control as scheduled for the particular material. A typical cycle is to bring the temperature up to 1550° F at the rate of 100° F per hour, hold it for 4 hours, cool to 1370° F at the rate of 50° F per hour, then to lower it from 1370° to 1000° F at 10° F per hour. When the temperature falls below 1000° F, the steel may either be allowed to cool in the furnace or in the air as desired.

Although the depth of decarburization which may readily be recognized as such, when former annealing methods were applied, is in the order of about 1/32-inch, partial decarburization is known to exist to much greater depths<sup>2</sup>. For instance, on a 2-inch diameter bar the total affected depth may be as much as from 1/16 to 1/8-inch. Instead of having 0.50 C in this zone, it may be as low as 0.38 to 0.40 C. The difference in carbon content is not great, but nevertheless may have an undesirable effect in subsequent heat-treating operations for certain applications.

**Surface Carbon Same as Core**—When the carbon correction process is used, not only is it possible to hold the surface carbon to the same content as the core, but to increase it slightly above that of the core. For a 0.50 C content, it may be raised to 0.55 or 0.60 C, or even to 0.65 or 0.70 if desired. Thus, for parts where high wear resistance is desired, and the bar is ground to finished size by the removal of approximately 0.006-inch of the surface, the desired carbon content at the surface and slightly below for good wear resistance, following an induction hardening treatment, is obtained. It has thus proved possible to obtain the wear resistance comparable with that of a carburized bar or part, and at the same time produce a tougher core than is ordinarily obtained from the usual carburizing grades of steels. Furthermore, it is never necessary to remove any stock to eliminate decarburization from the union drawn bars, surface grinding to size being necessary occasionally as when the part has been previously hardened by the induction method.

Applications for carbon corrected bars have continued to multiply since the process was first applied



to alloy bars. Pins for track-laying tractor treads, piston pins, automobile engine water pump and fan shafts, king pins, washing machine parts, farm implement parts, and textile machine spindles are now being produced from this material. Some of the economies afforded are indicated by the following examples.

**Process Used with Plain Carbon Steels**—In addition to the steels previously listed, the carbon correction process now is applied to the "plain" carbon steels ranging from AISI C-1035 to C-1095, and to the low chromium steels such as AISI (SAE) 4042 and 5046. Results obtained with plain carbon steels are especially interesting.

For tractor track pins of AISI C-1050 steel ranging in size from 1.0 to 1 3/4-inch, where it was formerly necessary to remove about 0.030-inch of decarburized surface from oversized stock, no machining operation is now necessary. In another case the material for a fan spindle formerly was AISI C-1117, a high-manganese, high-sulphur carburizing steel. By using AISI C-1144 with corrected surface, all the necessary wear resistance was obtained, and at the same time the rate of corrosion was reduced compared to the carburized part due to the lower carbon content. For washing machine shafts carburized parts were replaced by the carbon corrected AISI C-1146 steel with greatly reduced grinding requirements.

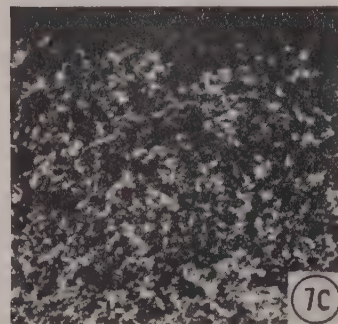
2. The differences referred to here can be determined only by a chemical analysis. From 3 to 5 samples are taken from each furnace charge to check carbon content.



6

Fig. 5—(a) Hot rolled 52100 steel (X1000) after carbon correction. Note completely uniform grain structure from surface to core. (b) Same steel before carbon correction (X100)

Fig. 6—Carbottom furnace with car rolled out from under cover for loading and unloading. Car is moved in and out on rails by means of power-driven rack



7C



7B

Fig. 7—(a) Hot rolled 5046 steel before treatment (X100). (b) Same steel after treatment (X100). Carbon corrected to normal amount. (c) Same steel with surface carbon slightly increased above normal amount (X100)



7A

Application of the carbon correction process has proved especially suitable for flats. A company had been using AISI C-1141 open fired pearlitic-annealed hot-rolled stock. With this material it was necessary to remove 1/16-inch on each side. When the company changed to carbon corrected stock, it was necessary to remove but 1/64-inch to obtain the desired finished surface condition.

**Alloy Applications**—Interesting alloy applications have also been developed. On a washing machine application, parts formerly made from C-1117 carburized, are now made from carbon corrected AISI 4042. The 4042 steel is oil quenched, which results in less dis-

tortion than formerly obtained with the C-1117 steel water quenched.

Truck king pins where high-carbon annealed stock was formerly used, and which required removal of 0.045-inch all around to eliminate decarburization, are now made using carbon corrected AISI 5046 steel. The former size was 1.187-inch. Present size 1.125-inch. Finished size in both cases 1.109-inch.

Use of carbon corrected stock up to approximately 1 3/4-inch in diameter or thickness has proved the most economical practice in most cases. Above this size under present conditions turned and polished bars can be purchased about as cheaply as the cold drawn carbon corrected bars, and vice-versa. However, the polished bars do not provide any added carbon on the surface such as is obtainable with the carbon corrected bars. Thus, where the additional surface carbon will prove beneficial in obtaining increased hardness, the carbon corrected bars may still be preferable in even larger sizes.

This would indicate that there are numerous additional applications for carbon corrected bars where either alloy or plain carbon steels are now used. The maintenance or increase of the surface carbon obtainable with the corrected bars frequently provides adequate wear resistance (Please turn to Page 144)



## 110

# FIXTURES

**... speed broaching of radii and slots in steel components for Buick Dynaflow converter**

Fig. 1—Reverse brake band anchor strut, several of whose surfaces are broached

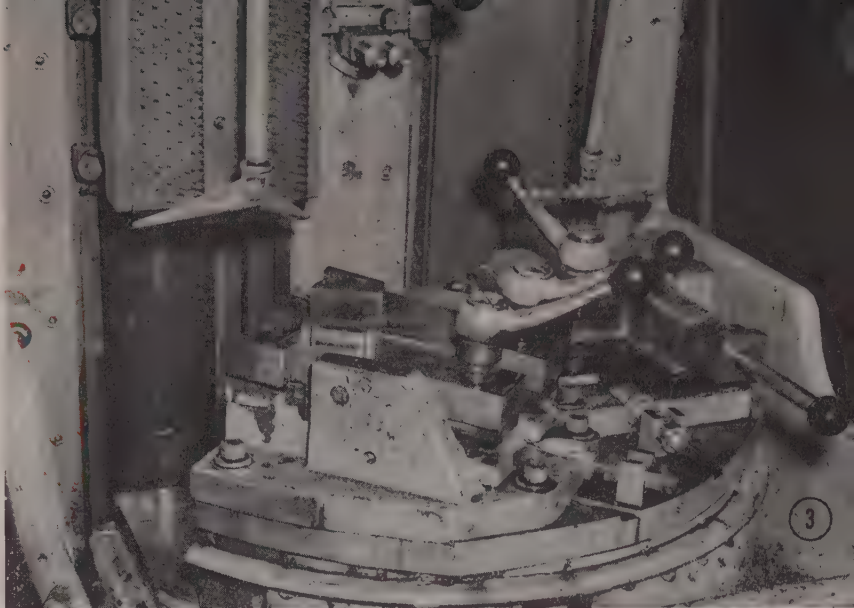


Fig. 2—Brake band anchor lever having a v-notch broached at the hub end and a ½-inch convex pad broached at the opposite end of the forging

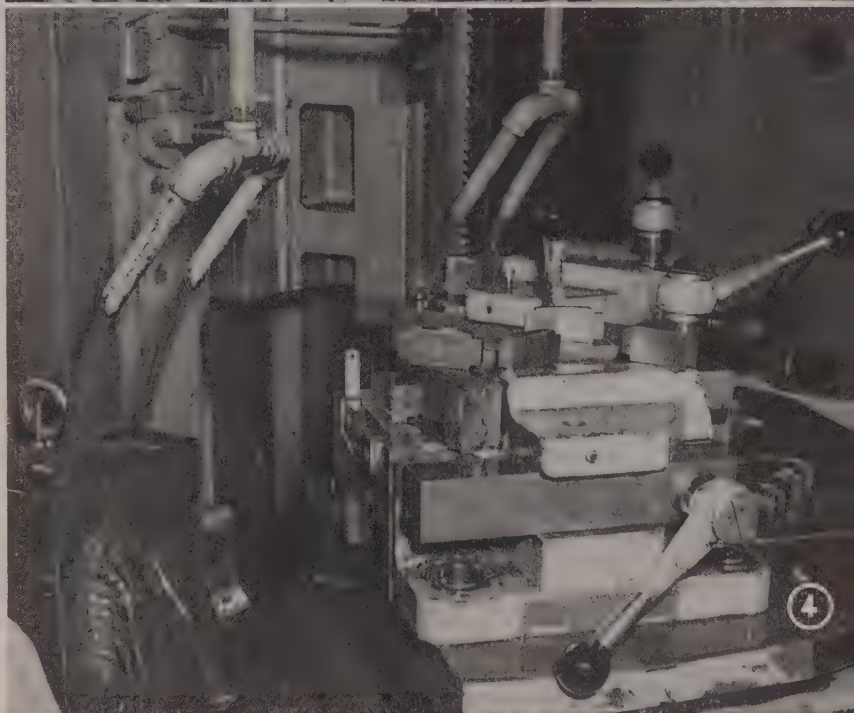
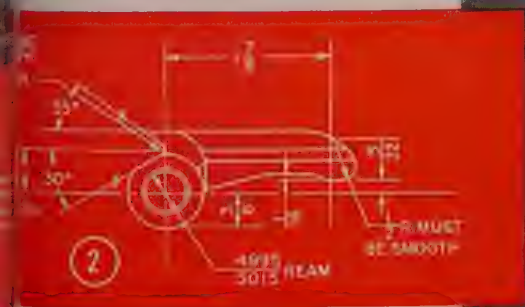
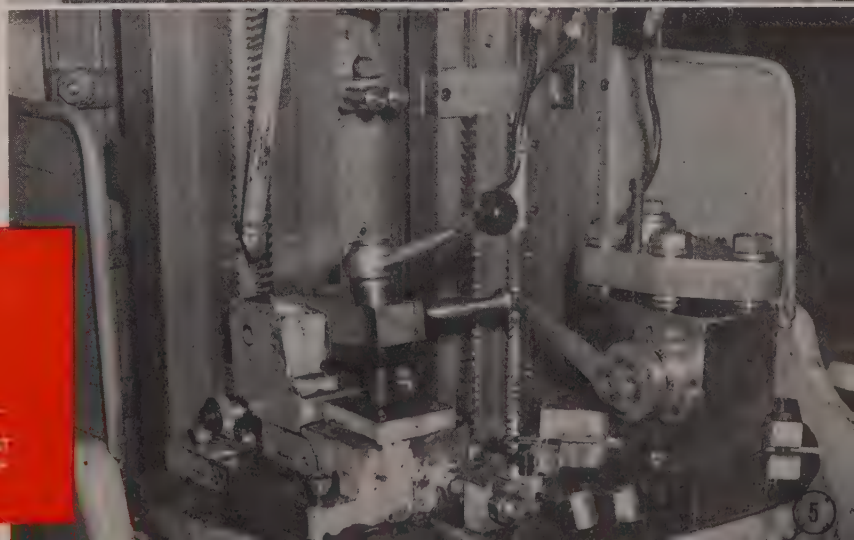


Fig. 3—Setup for broaching two corner notches in each of a pair of blanks set in pair of fixtures at left. A second pair of blanks in fixtures at right has just been broached

Fig. 4—Another broaching setup involving two pairs of broaches and two pairs of fixtures. Of each pair of broaches, one produces a concave radius and one an end slot. Blanks and broached parts are shown resting on top of the fixture

Fig. 5—This machine has two pairs of fixtures that cut v-slots in levers and, in some cases, produce broached convex pads on the same forged parts





# Casting Production

**...by materials handling ingenuities**

STEEL foundry business on the eastern seaboard is essentially a jobbing business—every order is special, and runs seldom exceed a few hundred pieces. We have found by experience that up-to-date materials handling systems and equipment can bring very real improvements in dollar economies, the ability to execute larger orders, expediting delivery of back orders, and reducing new construction costs.

We are now running a jobbing business on a production basis. We feel that we have borrowed the materials handling thinking of the mass industries—added a few ingenuities of our own—and applied it to our operations.

Let us get down to cases and show how materials handling aids have permitted these economies and improved customer relations. The most outstanding case is the handling of small castings ( $\frac{1}{4}$  to 50 pounds) in cleaning and finishing departments, by two electric fork trucks. It was found after a thorough study from a materials handling that small and large castings should be handled by two different methods to overcome the lag between production and shipment from the cleaning and finishing departments. Castings weighing over 50 pounds are handled by crane and those under 50 pounds by industrial electric trucks. This procedure required the building of a low height structural steel and masonry wing to the existing cleaning mill. Before we adopted this electric fork truck method of handling, small castings were magnet crane-handled. Since the two fork trucks were put to work, tonnage shipments of this class of castings have increased 38 per cent; thus, considerable savings have been achieved in producing the casting, and costs of larger magnet crane-handled castings have been reduced. The overall reduction, due to handling two classes of castings separately, has amounted \$5 to \$7 per ton. The advantage of lower handling costs was not the only gain made possible by our ability to handle both large and small castings more rapidly. It has led to more prompt deliveries of both classes of work, permitting the acceptance of larger orders. The average castings per order was increased 54 per cent from 1942 to 1948. With the ability to produce larger orders more efficiently and economically, along with orders for one and two pieces, we effect a cost reduction in all other departments, which will carry through even on any future, reduced output basis.

Finally, savings were achieved through reduced new construction costs of a building required to separate the two classes of castings. For a building strong enough to mount a crane, construction cost would have been at least \$10,000 more. Since the cost of a crane is approximately equal to that of

*This organization gained much in dollar economies and customer relations by carefully considering and applying modern materials handling procedures*

two suitable electric fork trucks, the overall capital expenditure was lowered by the difference in construction cost; also depreciation rates are greater on industrial trucks than on an investment in structural steel buildings.

In our move to streamline production, the new wing was provided for small casting cutoff, grinding, chipping and inspection operations. Plans provided for two electric fork trucks instead of overhead cranes as mobile units for transporting the thousands of castings through cleaning, finishing and inspection operations. Castings are toted by fork trucks in special cast steel baskets, which hold them throughout both the cleaning operation and the heat treating operation.

After the first shot blasting operation, small castings are dumped into hoppers, Fig. 3, which are then transported by fork trucks, dumped and segregated into the basket which carries them from this segregation point, through burning, cut-off, chipping, grinding and inspection, and heat treatment. As shown in Fig. 1, baskets are designed for tiering, truck handling, and crane handling. The sides, bottoms and wedges which make up the baskets can be machine molded very economically, in contrast to a mold requiring a full day to make a conventional cast steel annealing box. They require no welding or rivetings, but are simply assembled and held together by wedges, and parts needing replacement can be easily replaced. They are of such a size that they can be spotted at individual operation stations, where they are easily accessible to the operator. These baskets have been in use since mid-February, 1948, being put through the heat treating cycle daily. Estimated weight loss, by scaling, approximates 30 per cent. Although some of the first that were made have become buckled and warped by heat, they are still usable, and none have been scrapped to date. Buckling has been remedied simply by slight redesign on later baskets produced.

After castings have been dumped from the hopper for segregation into baskets, they are transported by fork trucks to a cut-off or burning operation, followed by inspection. Riser removal, when possible, done with high speed abrasive wheels, cuts down subsequent grinding time, or eliminates it on some pieces, by presenting a surface true to casting form. Cast-

# Costs Reduced

By H. L. McCLEES  
President  
Crucible Casting Co.  
Lansdowne, Pa.



ings for grinding are fork-truck handled to the grinding stations. After grinding, they are again inspected; substandard castings are segregated and, if feasible, conditioned to meet quality standards. Castings requiring chipping are transferred to chippers manually by inspectors.

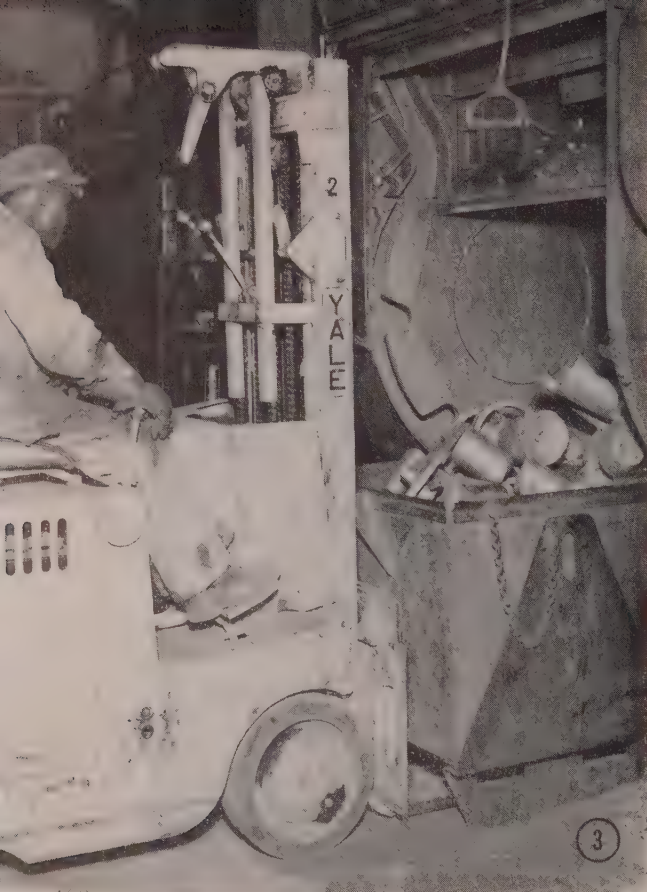
After passing inspection, baskets are placed on a platform scale, where accurate weights are recorded for management's use as production guides and as a basis for incentive rates, cost keeping, etc. Baskets are then delivered to heat treating furnaces, which are located in an adjoining large cleaning and finishing mill.

Another example where efficient materials handling has benefited the company is in the adaptation of pop-off flasks to the molding of castings weighing up to approximately 100 pounds. Here, an overhead monorail system, pouring devices, and the use of roller conveyors eliminate much handling, transporting and storage space required for ordinary type

*Fig. 1—Special baskets, which hold small castings as they are transported by fork truck through cleaning, grinding and inspection, are designed for tiering and crane handling as well as truck handling. They require no welding or riveting but are simply assembled and held together by wedges*

*Fig. 2 — Special racks for holding cores during drying are moved by electric trucks. Previous to this method of materials handling, cores were handled manually*





*Fig. 3—After first shot blasting operations, small castings are dumped into hoppers which are then transported by fork trucks, dumped and segregated into the basket which carries the work from this segregation point, through cleaning, finishing and heat treating departments*

flasks, and free such space for added production.

The pop-off flask system involves a master set of flasks for ramming, which remain at the molding station; and jackets for pouring, which remain at the pouring station. Castings are rammed with green sand, cores set and placed on a pallet at the molding machine, pallets holding from one to three molds, depending upon their size. Closed molds are carried on roller conveyors to the pouring station. Here, a pouring jacket is put over the completed sand mold, casting is poured and jacket then transferred to the next mold. This procedure eliminates the necessity of transporting flask sections back and forth between ramming and pouring floors. Leaving the single ramming flask equipment and pouring jackets where they are used, eliminates considerable handling and transporting, as is necessary with conventional type flask sections.

The roller conveyor and pallet system permits castings to be transported by fork trucks, after pouring, to the shakeout station. The pallets are constructed of welded, rectangular steel tubing. Dumping of the sand mold and casting onto a shakeout screen, is accomplished by placing the pallet over stakes on the side of the shakeout; then backing the fork truck,

which dumps the mold. Bottom boards are returned to pouring station via fork truck.

Electric fork trucks and conveyors are by no means all of the materials handling equipment used at this plant. Mechanical hand trucks and hoists are also utilized in sand mulling, coremaking, molding, casting, cleaning, and shipping departments, aiding us in handling approximately 12 tons of various materials for each ton of steel castings produced. Electric trucks facilitate the movement of patterns to and from production line to pattern storage. This fast movement, with a minimum of effort on the part of the operator, keeps production space free of unneeded patterns, where they would only impede production, and carries them to storage, where they are readily available for future use. Electric trucks are used to carry sand and ingredients from storage to coremaking and molding sand mullers, and to move cores on suitable mobile racks, into and out of drying ovens, Fig. 2. Mechanical hand trucks also are being used to transport core racks in and out of the drying ovens, at a considerable saving of space and handling expense. Before truck and rack equipment was used, cores had to be placed in and removed from ovens by hand, to and from stationary shelving. Savings here are obvious.

Mechanical hand trucks and a dormant platform scale (platform flush with the floor) are integrated into a materials handling technique for supplying the electric furnace with accurately weighed raw materials. The truck and its load is merely rolled onto the platform where, with truck and container weights tared off, net load is recorded automatically. No time is lost shifting the load in weighing, and accurate weight records are maintained by eliminating the uncertainty of the lead pencil.

Many hand chain and electric hoists are spotted throughout the plant to aid in moving material and making work easier and faster. Electric hoists are stationed at molding stations for lifting copes and drags for large castings up to 1000 pounds each. A large castings cleaning and finishing department is also equipped with electric hoists to handle huge work at swing frame grinding machines. Grinders are suspended by hand chain hoists for easy accessibility to all casting surfaces. An electric monorail hoist is used in the shipping department to handle large individual castings from final weighing to shipping platform and truck loading. Also, an electric fork truck transports smaller castings in suitable skid boxes from weighing to shipping platform and truck loading.

We have gained much in dollar economies and customer relations by carefully considering and applying modern materials handling procedures. We find many and varied applications for our electric trucks, in conjunction with electric hoists, scales, mechanical hand trucks and other equipment, that had not previously been considered; thus, usefulness of our present equipment is constantly being extended, with the adaptation of newer materials handling methods. This procedure requires no mass upheaval or rearrangement of plant facilities, as the primary necessity for application of an electric truck system is a good floor.

**A**LMOST 50 years have passed since Frederick W. Taylor appeared before a Congressional investigating committee to explain his views on scientific management and, in particular, to discuss the practice he formulated, which had come to be known as time study.

The intervening years have witnessed a cavalcade of industrial engineers, sometimes derisively dubbed "efficiency engineers," who have practiced the art of time study in virtually every industrial establishment across the country. Numerous texts explaining the practice of time study have appeared. Most colleges have at least one course in the subject included in their industrial engineering or business curricula.

Some labor unions have their own time study departments and have issued publications on the subject. Industrial engineering societies hold "time study clinics" in major cities.

Although general time study procedure, to judge from recent publications, has become fairly standardized as to forms, element breakdown, and methods of watch reading, time study practice still has one Achilles' heel—operator rating. The writer has pursued this subject at length with hundreds of industrial engineers in the time study classes he has conducted, and in various plant industrial engineering departments. Diversity of opinions encountered and problems created by this weak point prompted him to prepare this analysis of methods of comparing an operator's performance to the time study observer's concept of normal.

Without inferring any political overtones, it is possible to arrange the schools of thought on this subject from right to left with the advocates of the selected time method on the extreme right and the "time study-without-a-watch" group on the left. Each believes that he has arrived at the proper method of determining what is average operator performance.

**Procedures**—Let us assume that a time study observer has taken a study out in the shop and that we all agree on the element breakdown and the method of reading the stop watch. Our next point is to set a standard time for the operation. To do this we must convert the watch readings to a level which is representative of an average operator. Without attempting to take sides, the writer will now review the various methods of achieving this result which he has encountered.

**Selected Time Method**—From the time values listed after each element, the observer will select that time value which he considers most representative of the proper time element. This time will be posted in the summary column.

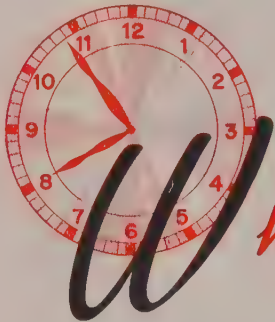
ELEMENT 1	TIMES (DECIMAL MINUTES)	ALLOWED TIME
Pick up part in right hand and place in fixture	.12 .11 .08 .09 .11 .13 .15 .17 .12 .11	

**Arithmetic Average**—The observer will select an operator whom he considers representative of normal performance. Average of all times recorded for each element will be posted in the summary column.

ELEMENT 2	TIMES (DECIMAL MINUTES)	ALLOWED TIME
Pick up part in right hand and place in fixture	.12 .11 .08 .09 .11 .13 .15 .17 .12 .11	.119 10

**The Mode**—Time value recurring most frequently for each element will be selected and posted in the summary column.

By **RALPH H. STEARNS**  
General Motors Institute  
Flint, Mich.



*What is a Fair Day's Work?*

*Time study research is concerned presently with determining the range of human capacities, attempting to replace an observer's judgment with knowledge*

ELEMENT 3	TIMES (DECIMAL MINUTES)	ALLOWED TIME
Pick up part from die with both hands and place in gondola	.09 .08 .10 .11 .09 .09 .10 .09 .10 .09	.09
	.08 1	
	.09 1111	
	.10 111	
	.11 1	

**The Median**—Time values are arranged in a frequency distribution and the median time value is selected to be posted in the summary column.

ELEMENT 4	TIMES (DECIMAL MINUTES)	ALLOWED TIME
Pick up part from die with both hands and place in gondola	.07 .09 .08 .09 .08 .10 .11 .09 .12 .11	.09
	.07 1	
	.08 11	
	.09 111	
	.10 1	
	.11 11	
	.12 1	

**Overall Percentage Rating**—The operator's entire performance is considered by the observer in relation to his conception of normal or average performance. This comparison is expressed as a decimal per cent and posted next to the average time. Multiplying the average by the decimal gives the final allowed time for the element (See Element 5.)

**Selected Average**—The observer eliminates any time values which he believes are not representative of the proper method and averages the remaining time values to arrive at allowed time. (See Element 6.)



ELEMENT 3	TIMES (DECIMAL MINUTES)										ARITHMETIC AVERAGE	RATING	AL-LOWED TIME
Pick up part from die with both hands and place in gondola	.07	.09	.08	.09	.08	.10	.11	.09	.12	.11	.097	1.10	.107

ELEMENT 6	TIMES (DECIMAL MINUTES)										ARITHMETIC AVERAGE	SELECTED AVERAGE
Pick up part from die with both hands and place in gondola * Pick up tool from floor.	.08	.09	.26*	.07	.09	.10	.08	.09	.08	.08	.102	.084

ELEMENT 7	TIMES (DECIMAL MINUTES)										ARITHMETIC AVERAGE	FACTOR RATING	AL-LOWED TIME
Pick up part in right hand and place in fixture	.12	.11	.08	.09	.11	.13	.15	.17	.12	.11	.119	1.06	.126
Excellent	.10										.02		
Good	.05										.01		
Average	0										0		
Fair	-.05										-.01		
Poor	-.10										-.02		

ELEMENT 8	TIMES (DECIMAL MINUTES)										ARITHMETIC AVERAGE	TEMPO RATING	AL-LOWED TIME
Pick up part from die with both hands and place in fixture	.12	.11	.08	.09	.11	.13	.15	.17	.12	.11	.119	1.05	.125

ELEMENT 9	TIMES (DECIMAL MINUTES)										ARITHMETIC AVERAGE	LEVELING FACTOR	AL-LOWED TIME
Pick up part from die with both hands and place in fixture	.09	.08	.10	.11	.09	.09	.10	.09	.10	.09	.094	.88	.083
Reach from table to die											.015		
Grasp part with both hands											.008		
Lift part from die											.020	.083	
Carry part to gondola											.020		
Reach to bottom of gondola											.012	.094	
Release part on pile											.008		
											.083		

**Factor Rating**—The observer rates the operator as in a job evaluation plan, for the number of characteristics such as skill, dexterity, effort, consistency and or job conditions. Sum of these ratings is posted as a decimal per cent and multiplied times the arithmetic average. (See Element 7.)

**Tempo Rating**—Observer considers only the operator's pace or tempo in determining the rating factor which is expressed as a per cent. He compares the operator's tempo to his concept of normal. (See Element 8.)

**Synthetic Leveling**—To determine the rating factor, arithmetic average for the element is compared to the synthetic movement time for the element. This synthetic movement time is developed by reducing the element to its fundamental movements and applying synthetic times to each movement. These synthetic times are derived by research with the aid of micromotion study and electrical timing devices. (See Element 9.)

This list indicates various methods of evaluating operator performance in terms of the observer's concept of normal performance. No attempt has been made at this time to weigh their various merits. At this stage of research, selection of the best

method will rest with the individual company in the light of its needs. Various groups such as the Society for the Advancement of Management Committee on Rating Time Studies are conducting research on the problem.

Advocates of the various movement time systems believe their systems will eliminate direct time study and hence the problem of operator rating. Plants with extensive standard data installations feel that they have averaged out errors due to differences in operator ratings. Statistical measurements have been applied to time studies to determine the adequacy of the sample which the particular time study represents.

**Rating Time Studies**—Essentially the problem of rating time studies has arisen because of the difficulty of measuring human effort within close limits. Various experiments show that where a standard of average performance is established, a group of time study observers may be trained to rate operator performance within limits of plus-or-minus 5 per cent. The first question is how to establish the standard of normal performance from which to rate. Second problem is whether to rate the operator by measuring the variation from normal arithmetically or to

allow the observer to estimate the variation.

Research at present is concerned with determining the range of human capacities and with attempting to replace the judgment element with knowledge, as through the use of movement time systems.

Will research enable us to narrow the range of that judgment, or to replace it entirely with knowledge? If so, the system fathered by Frederick W. Taylor will be better able to determine with accuracy what constitutes a fair day's work.

## 16-Second Work Cycle Special Machine Feature

Automotive upper control arm assemblies are processed in a 16-second cycle by a new drilling, countersinking tapping machine which is said to reduce floor space requirements to 25 per cent of former requirements. Built by Snyder Tool & Engineering Co., Detroit, the machine has one loading and two work stations. When four parts are loaded into the guide rails, against the rest plate, the automatic work cycle is started and parts are automatically shuttled into the drilling station.

Sixteen-spindle drill head is equipped with heat treated alloy spindles mounted in ball bearings and with standard adjustable drill adaptors. High speed steel drills are used. When drilling and countersinking cycle is completed, parts are automatically shuttled to the tapping station. Tapping unit is a solidly mounted sixteen-spindle, individual lead screw type tapping head and tapping speed is 40 surface speed per minute. Each work cycle completes sixteen 7/16-20 holes.

Indexing mechanism is three-station, hydraulically actuated transfer bar. When drilling and tapping operations are being completed, the shuttle mechanism returns to starting position. Parts are automatically unloaded at the rear of the machine. A work cycle of 16 seconds is said to produce 788 pieces per hour at 87½ per cent efficiency.

—O—

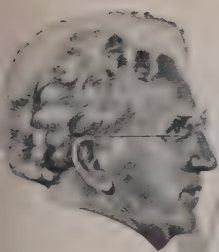
Weighing but 32 pounds and operating from a light socket or wall plug, the new NCD air compressor built by DeVilbiss Co., Toledo, O., holds a large capacity spray gun at 34 pounds pressure and delivers 2½ cubic feet of air per minute. Other jobs it will perform include blowing dust or dirt from objects as filters, radiator grilles, and refrigerator cooling coils, inflating tires, spraying insecticides and disinfectants, etc.



All stainless  
and heat resisting  
arc welding electrodes  
stocked.

Also electrodes to meet  
specific analyses.

Complete facilities  
for cold drawing,  
rolling, pickling and  
annealing.



Whitey sez:

"When the performance of a product exceeds  
expectations, that product pays extra dividends  
to the buyer. For this reason, Maurath stainless, heat  
resisting and special purpose arc welding electrodes  
are deliberately built to exceed expectations."

**MAURATH, Inc.** 21800 MILES AVENUE  
CLEVELAND 22, OHIO



# PRODUCTION OF

# Tool Steel

## FUNDAMENTALS OF STEELMAKING

NUMBER

4

OF SERIES

Another in a continuing series of articles on the making of steel and finishing it into products ready for the consumer. Each article is written by an outstanding authority in his particular field.

*The author points out in this second section that decarburization is a fundamental problem connected with the production of tool steels. It is more severe the longer the heating time and the higher the heating temperature utilized*

By **GEORGE A. ROBERTS**

*Chief Metallurgist  
and*

**CHARLES F. SAWYER**

*Plant Metallurgist  
Vanadium-Alloys Steel Co.  
Latrobe, Pa.*

INGOTS charged from molds directly into heating furnaces or soaking pits are heated by holding at about 1800 to 2000° F until temperature is uniform throughout their mass. Temperature is then raised rather rapidly to the proper degree where, after a short soaking period, they are ready to forge or bloom. Ingots which have been slowly cooled are heated by placing them in a cool furnace, bringing them up to a temperature of 1400 to 1500° F slowly, after which the heat is increased about 100° F per hour until desired forging or rolling temperature is reached. Finally they are soaked for a period sufficient to insure a substantially uniform temperature from surface to center.

The first slow heating period is necessary in order to minimize the temperature gradient from surface to

center for high temperature gradients will lead to cracking. Length of the soaking period at forging or rolling temperature is kept as short as possible consistent with acceptable hot working properties because of decarburization of surface layers of the ingot. Of necessity, the larger the ingot the longer will be the soaking time. Decarburization is one of the fundamental problems connected with the manufacture of tool steel. Decarburization is more severe the longer the heating time and the higher the heating temperature.

Optimum forging or blooming temperature varies with the kind and amount of alloying elements present in the steel. As an example, plain carbon tool steels are heated from 1850 to 1950° F, the cold work die steels 1950 to 2100° F and high speed steels 2000 to 2200° F. In general, steels containing appreciable amounts of alloying elements, such as carbon, silicon and molybdenum which lower the temperature where the liquid phase appears on heating, must be soaked at lower temperatures than steels containing alloying elements such as chromium, tungsten and cobalt.

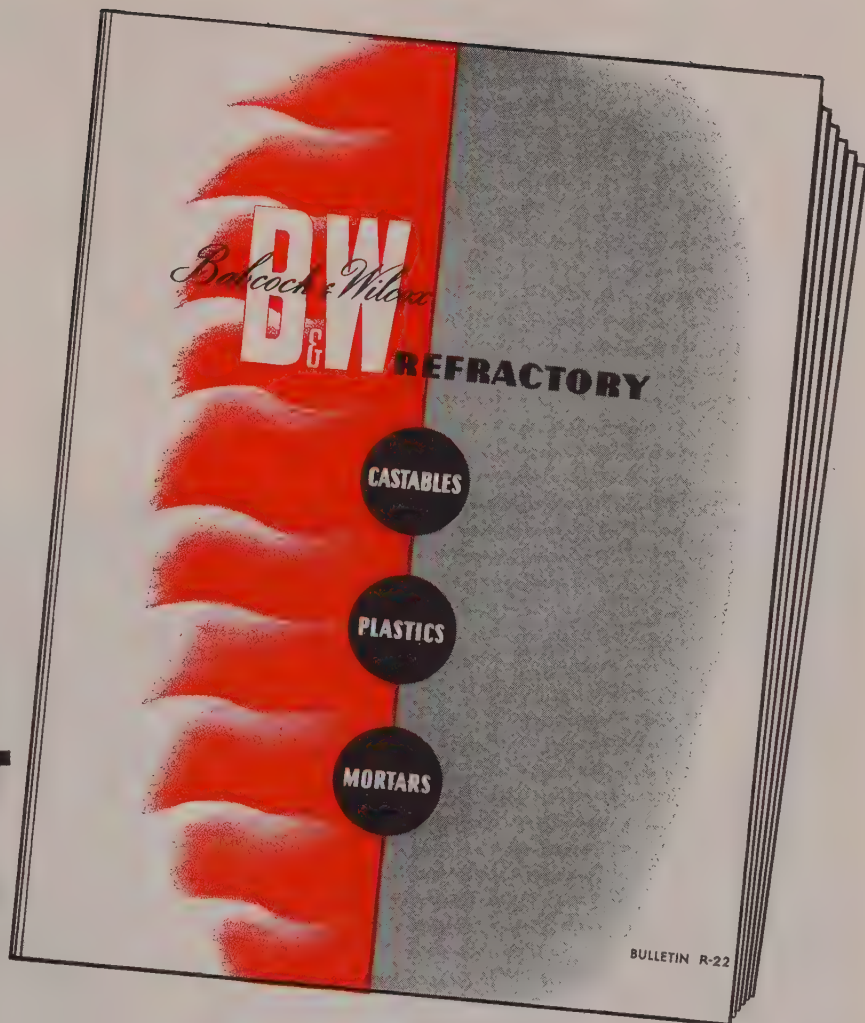
Blooming of ingots to billets is confined almost entirely to plain carbon and some types of cold work die steels where complex carbides, compounds of

Fig. 6—Rolling a bar of tool steel on a 12-inch mill



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Where  
to use it!*

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BOOKLET**



Here, for the first time, is a handy reference booklet summarizing significant data and application information for a wide range of important refractory materials:

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Furnace designers and builders looking for ways to reduce first cost ... furnace owners and operators seeking longer furnace life, less maintenance, increased output ... will all want this convenient bulletin. Your copy of Bulletin R-22 is waiting for you ... write for it today.

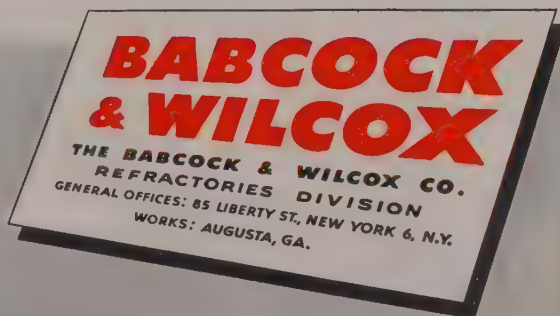


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R-346



# PRODUCTION OF *Tool Steel*

iron, carbon and one or more of the alloying elements are completely dissolved in the steel at rolling temperature. Blooming mills are either two-high, consisting of two rolls which are reversed in direction as the ingot is rolled forward and backward between them, or three-high consisting of three rolls which maintain the same rotation as the ingot is passed forward between the bottom and middle roll and backward between the middle and top roll. During rolling the ingot is decreased in size and increased in length with each pass until final billet size is reached. The single length is then sheared into the proper multiples, depending upon final bar size. If the ingot has been inspected and ground before

rolling, billets may be taken to a smaller rolling mill and either with or without a short reheating rolled immediately into finished bar.

Forging or cogging of ingots to billets is done on either a press or a steam hammer. The steam hammer has been preferred in the past because the rapidity of the blow was felt to be effective in breaking up the complex carbide network surrounding the steel grains of the ingot. Cogging is almost universally used in the tool steel industry to reduce ingots to billets when working with highly alloyed steels in which complex carbides are not all in solution in the steel at cogging temperature. In cogging, hammer dies are kept relatively narrow in order to elongate rather than spread the ingot as it is reduced in cross-

*Fig. 7—Hammer cogging a tool steel ingot*



# Tool Steel

section. Flat dies are used and after light blows to remove taper and consolidate the grain structure of the ingot, quite heavy blows are struck for the purpose of working the entire cross-section and speeding up reduction of the ingot to a billet.

Cogged billets and billets bloomed from uninspected ingots are slowly cooled after hot working, either by cooling in an annealing furnace or by burying. After cooling to room temperature, billets are carefully inspected and any surface cracks or flaws are ground out. For a complete inspection billets are usually "skinned" by grinding the entire surface lightly which allows small defects to be seen. Steel billets particularly susceptible to decarburization, such as high speed steels containing 5 to 9 per cent molybdenum, are ground quite heavily all over. Billets for an end-product to be used on an exacting job are inspected by cutting a slice from one or both ends and subjecting the slice to a deep etch in 50 per cent water, 50 per cent hydrochloric acid. This etching reveals any undesirable internal structure which may be a cause of failure in the finished product.

Billets, after inspection and conditioning, are reheated to a temperature of 50 to 100° F lower than cogging or blooming temperature and rolled into the finished bar. This rolling is done on merchant or belgian mills which are two-high with roll stands arranged in a line. There are six to eight stands of rolls in the mill. Men on either sides of the rolls pass the billet through various grooves in the rolls, effecting an increase in length and a decrease in diameter with each pass. Deformation resistance of tool steels is quite high even at elevated temperatures; therefore, reduction per pass is somewhat less than for tonnage steels. After the bars are rolled they are slowly cooled, either by burying or by placing many bars inside a large pipe and allowing the entire mass to cool.

Annealing is a heat treatment given bars after rolling, designed, except in a few special cases, to produce a uniformly spheroidized structure of minimum hardness for each particular analysis. This spheroidized structure consists of carbides in the form of small globules well dispersed in a matrix of ferrite, a solid solution of iron and alloying elements. In this spheroidized condition, tool steels may be cold worked and machined quite readily.

The bars are placed in a furnace and heated to a temperature of 1400 to 1650° F, depending upon chemical analysis, soaked until the furnace load is uniform in temperature, and cooled at a rate of 20 to 50° F per hour. During this cooling the solid solution, ferrite, with spheroidized carbides is formed from a high temperature solid solution, austenite, which in combination with undissolved carbide exists at the annealing temperature. After this transformation, cooling can be accelerated even to removing bars from the furnace and cooling in air.

Decarburization must be avoided; therefore, an atmosphere which is neutral to the particular carbon

content of the steel must surround the bars during the time they are above red heat. This atmosphere may come from a generator, separate from the furnace, which exhausts protective gas into the annealing furnace which has a work chamber sealed off from air and any products of combustion. Another method is to pack bars in a pipe or box which is then filled with mica or sand containing a small percentage of charcoal, sealing tightly, and placing one or more of these containers in a gas or electrically heated furnace.

Another, and somewhat shorter, method called isothermal annealing is often used. Isothermal annealing consists of heating the steel slightly above the ferrite to austenite transformation temperature and holding until bars are uniformly heated. They are then cooled to a temperature slightly below the austenite to ferrite equilibrium transformation tempera-



Fig. 8—Tool steel bars being inspected by the Magnaflux method

ture, and held until they transform to ferrite plus spheroidized carbide. Cooling to this isothermal transformation temperature can be as rapid as may be desired. After virtual completion of the austenite to ferrite transformation, bars may be removed from the furnace to cool in air to room temperature.

Throughout the entire processing of the steel, the melting, heating and hot working operations are carried out under very close control essential to the manufacture of a high quality product. After annealing, bars are inspected for surface defects by the Magnaflux method. This consists of magnetizing the bars and sprinkling them with iron powder. Surface flaws cause a break in the magnetic force field,



thus leading to retention of the iron powder making any flaws visible. Following this inspection, both ends of each bar are cropped by nicking the bar and breaking off the end with a hammer. Fractured ends of the bars will reveal any pipe, porosity or excessive decarburization.

Brinell hardness tests are made on one or both ends of each bar and if maximum specified hardness has been exceeded they must again be reannealed and tested. A large percentage of tool steel bars is subjected to a deep acid etch test. A disk is cut either from crop ends or each end of the bar and etched in a 1 to 1 solution of hydrochloric acid and water at 160° F until internal structure is clearly revealed. These etched disks show any segregation, internal bursts, flakes, or nonmetallic inclusions, decarburization, and the fiber pattern developed by hot working. If an undesirable condition is found in an etched disk or cropped end, the bar is cropped back until a disk is obtained free from defects.

Inspection for decarburization is also made by chemical analysis of layers machined from the bar surface, microscopic examination, or the hardening of disks for file testing.

Customer requirements may dictate further testing or replace one or more of these routine tests by special hardenability or mechanical tests. Extensive testing of tool steel is both costly and time consuming but is necessary to the assurance of a high quality product.

Sheets from 0.025 to 1/8-inch thick are furnished from 16 to 24 inches wide and 5 to 7 feet long. The ingot is bloomed or forged into a slab about 3 inches thick, cooled and conditioned by grinding out any surface defects. Slabs are then heated and rolled to an intermediate product known as cog plate. This is then cooled, cut to proper length and pickled. Pickling consists of immersing the cog plate in a 10 per cent solution of either muriatic or sulphuric acid heated to 160 to 180° F for a time sufficient to remove all scale. Clean plate is then heated and rolled to approximately twice desired thickness into a product known as molders. The molders are then reheated to a temperature not exceeding 1600° F and rolled into a finished sheet.

Disks are produced by the upset forging of slugs cut from either round or square billets. They are furnished in sizes from about 2 1/2 inches in diameter by 1/4-inch thick to 24 inches in diameter by 6 inches thick. Billet size for any particular disk is selected so that the proper amount of upsetting consistent with good properties in the finished forging or tool will be achieved. A length of about three times the cross-sectional dimension is the maximum that can be upset without buckling when using flat dies.

After the proper slug is cut from the billet it is heated to 1900 to 2200° F, depending upon analysis, and placed lengthwise upon a flat die. Two light blows, turning the slug 90 degrees between each blow, are struck to knock off any scale. It is then placed

endwise on the flat dies and upset with heavy hammer blows. Considerable barreling or bulging occurs as the slug begins to approach desired thickness and diameter. In order to keep sharp corners it is necessary to turn the semifinished disk up and roll it on the die under light hammer blows to remove all bulge. Upsetting is then finished and the disk is rolled once more, removing any further bulging and forming a perfect round. A final heavy blow is given the disk on the flat to impart finished thickness and smoothness to the flat surface.

Making of ring forgings parallels disk procedure until after the first rounding up operation. At this point the disk is pierced about three-fourths of the way through by driving a blunt nosed, slightly conical plug into the center of one of the flat faces as the disk lies on the die. The partially pierced disk is then turned over and piercing is completed by shearing out the center slug with a single blow on a square nosed, slightly conical plug. At this point the roughly shaped ring is reheated. Final forging is done with the ring over a mandrel or horn similar to the horn on a blacksmith's anvil, the working taking place between this mandrel or horn and the top hammer die. In this manner the hole is expanded and wall thickness brought to the desired limit. During final forging steps, the ring must be removed from the mandrel or horn and struck between flat dies as often as is necessary to maintain sharp corners and proper thickness. Special sizes of rings can be manufactured, but standard tool steel practice is to hold maximum outside diameter to 32 inches, thickness between 1 and 5 inches and wall thickness not under 1 inch.

For certain applications, tool steel bars must have size tolerance, surface finish, hardness or cross-sectional shape that cannot be obtained in a hot rolled product. As a result, cold drawing and centerless grinding are utilized to meet these requirements.

Cold drawing of tool steels consists of pulling the steel through a die containing a tapered hole, the smaller end of the hole having a short continuation with no taper and called the bearing. This bearing is of the correct shape to impart desired cross-section as the steel is pulled through. Wire sizes from about 3/8-inch in diameter and under are drawn as coils which wind onto a revolving drum on the die's exit side. Large sizes are drawn on horizontal draw benches in which a gripping device on the exit side of the die rides on a buggy pulled by a motor-driven chain. The larger sizes are limited to bar lengths.

Tool steels have a relatively high work hardening capacity and initial hardness; therefore, individual drafts are limited. For practically all except plain carbon and lower alloy content steels, annealing must follow each draft as diameter of the bar or coil is reduced.

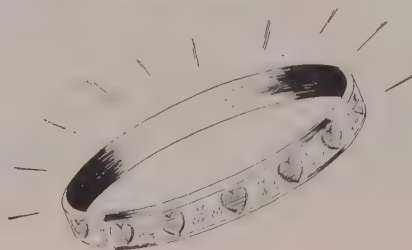
After drawing to the desired diameter, bars or coils are straightened, cut to length and centerless ground to produce a product known as drill rod. Drill rod is available in any type of tool steel manufactured, but the greatest production is in either carbon tool steel or high speed steel. Drill rod with a cross-section other than circular is furnished without grinding.

**CHIEF KEOKUK'S**

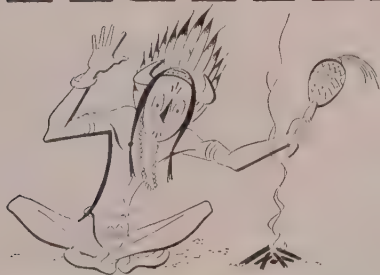
# Heap Big Wedding



Here is the groom—Ready and willing



Here is the RING—(Isn't it thrilling?)



Here's the medic—With painted hide



In fact, here's everything—Except the BRIDE!

*And where is the blushing bride? She's busy getting her war paint on too! And stitching that last bit of lace on her buckskin. Who is Keokuk's mystery bride? Is she a lulu or a droopy heiress? Will Keokuk marry for love or money? For the answers watch for the next breathless episode in The Life and Loves of Chief Keokuk.*

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## Reduction Gear Teeth Cut to Tolerances of

# One Ten-Thousandth of an Inch

SHOWN being fabricated at the Sunnyvale, Calif., works of Westinghouse Electric Corp., this 7½-

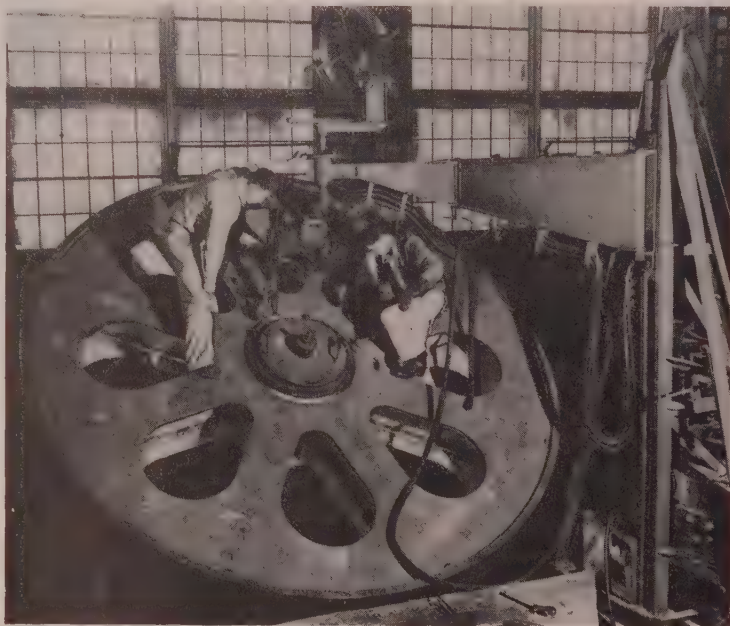
ton "bull gear" is one of two similar gears to drive a large marine ore carrier. The two gears work

in the final stage of a series of gears taking the full load of a 7000-horsepower marine turbine propulsion unit and reduce the speed from 6000 to 100 revolutions per minute for the propeller shaft.

The hub is being welded to the centerpiece that forms one side of the wheel. Flux is fed automatically as the wheel turns slowly under the welding machine.

Two kinds of steel go into this huge bull gear wheel. The rim is high carbon steel to be hobbled later into 693 helical teeth that must eventually withstand great pressures under continuous operation. The remainder—hub, centerplates, and ribs—is made from mild or medium carbon steel.

Despite its size and ruggedness, each gear must be made to extremely close tolerances for such massive equipment. Since the slightest inaccuracy in gear teeth will cause excessive vibration and noise in the ship, inspection is rigid. Any imperfection, however small, will cause rejection. Tolerances for the helical teeth cut in the rim are as close as 0.0001-inch.



Wheel turns slowly under the welding machine as hub is being welded to the centerpiece of the large marine propulsion "bull gear"

## Press Tonnage Adjustable

Designed for the forming of special signs, the 350-ton HydroElectric forming press, developed by R. D. Wood Co., Philadelphia, Pa., is adjustable in tonnage between 85 and 350 tons. Press is offered with motor-driven pumping unit, control valves and piping, with pump volume and press speeds adjustable from zero to maximum. The 14.7 gallons per minute, 2000 pounds per square inch radial piston pump is driven by a 15 horsepower electric motor and is mounted on the top platen.

— 0 —

Charts of mailing and parcel post scales made by Toledo Scale Co., Toledo, O., have been redesigned to accommodate the new air parcel post service and the increased postal rates effective Jan. 1, 1949. Chart figures are provided to automatically com-

pute charges on air parcel post and all classes of mail affected by the change in postal rates.

## Drawn Alloy Wire Offered

Now available in sizes down to 0.060-inch in diameter are Hastelloy and Multimet alloy drawn wire for welding, metal spraying and the manufacture of wire screen, wire cloth and springs. Offered by Haynes Steelite Co., Kokomo, Ind., the wire is furnished in coils or in cut and straightened lengths, either bare or flux-coated. Sizes below 0.060-inch are supplied by an associate company, Kemet Laboratories Co. Inc., Cleveland.

— 0 —

Metal Powder Association has published a supplement to its standard 4-45, a method for the determination of apparent density of metal powders. The supplement presents a sta-

tistical evaluation of the precision of the Hall flowmeter as an instrument for determining apparent density. Copies are available in printed form from the association, 420 Lexington Ave., New York 17, for 25 cents per copy.

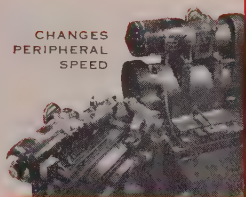
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First deliveries have begun on the Conju-Gage, model 1-S, a new type of gear-checker introduced by the Eastman Kodak Co., Rochester, N. Y. It provides a quick and accurate composite check of spur and helical gears of pitch diameter up to 1.25 inches. A review of this gage, describing its principles, appeared in STEEL, April 5, 1948 issue.

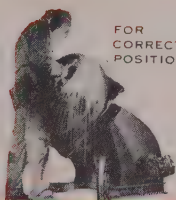
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Northwestern Tool & Engineering Co., Dayton, O., has added 10-24 knurled head screws and 10-24 quarter turn screws to their catalog.

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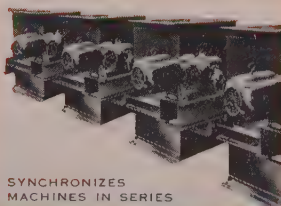
CHANGES  
IN SIZE  
AND WEIGHT



MAINTAINS  
CONSTANT PRESSURE



SYNCHRONIZES  
MACHINES IN SERIES



FOR CHANGES  
IN TEMPERATURE



# **SPEEDRANGERS**



# New Books

## How To Build an Adequate Exhaust System

*Design of Industrial Exhaust Systems for Dust and Fume Removal*, by John L. Alden, assistant works manager, Western Electric Co., Kearny, N. J.; leatherette, 252 pages, 5 1/4 x 9 inches; published by Industrial Press, New York, for \$3.50.

Information on exhaust ventilation for the removal of undesirable heat, fumes, dust, vapors or otherwise contaminated air has been considerably expanded in the last few years. For example, a great deal more is known today about the toxicity of various solvents.

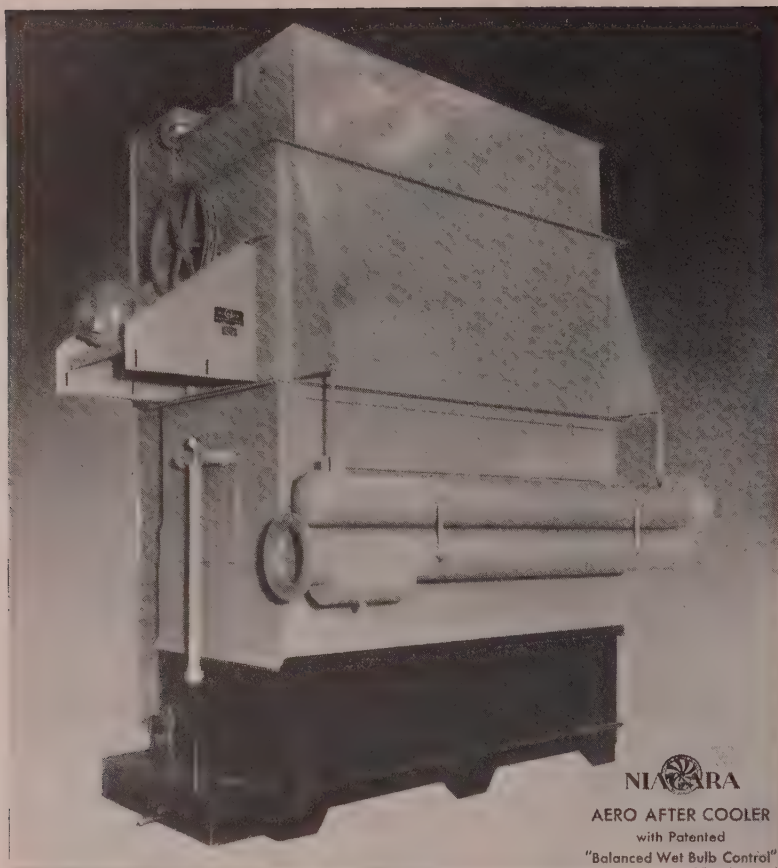
For these reasons, this book is now in its second edition, completely revised and with new chapters added. It tells the reader how to design, build or buy an exhaust system that will adequately and economically perform the functions required by law or prescribed by engineers or industrial hygiene specialists. Scope of the book includes exhaust ventilation, low pressure, pneumatic conveying, design of hoods, piping and structural details and selection of dust separators, centrifugal and axial flow fans. It contains 120 drawings and diagrams and has an extensive index.

## Practical Thread Guide Published

*Manual of Die-Head Thread Cutting*, by H. Schlarman; cloth, 266 pages, 5 1/4 x 8 1/4 inches; published by McGraw-Hill Book Co. Inc., New York, for \$3.50.

Intended to be a manual and practical guide on threads and threading for the small tool supervisors, trouble men, toolroom and screw machine foremen and operators as well as for the drafting room, the flexible-covered book will help shop men help themselves out of common thread cutting troubles and eliminate machine down time occasioned by waiting for a manufacturer's service engineer. It is not concerned with the specific makes of threading tools, nor is it intended to conflict with the manufacturers' instructions about their products. Its purpose is to explain the basic principles in producing threads by the use of die heads, practical application of those principles and the causes, effects and corrective measures for the common troubles experienced in everyday threading.

Liberal use is made of photographs, diagrams and charts. As a reference



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Write for Bulletin No. 98

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book, it explains the factors that comprise the chaser thread and their functions, theory and practice of sharpening radial, tangent or circular chasers, internal trips, their design and use and how to diagnose thread troubles visually and by gaging.

## Invention Record-Keeping Emphasized

*How To Keep Invention Records*, by Harry A. Toulmin, Jr.; cloth, 5½ x 8 inches, 78 pages; published by Research Press Inc., Dayton, O., for \$2.50.

A brief summary of the law and a complete description of how to use invention records for your own protection is included in this book, written by a trial lawyer for a patent counsel firm. The records are based upon the author's practical trial experience in the United States Patent Office and the United States courts and his industrial experience as an executive and director of various manufacturing and research organizations. Questions answered include what records are necessary to prove a date of conception, the requirements of proving the first test, what records of materials and personnel must be kept to prove the first reduction to practice, when are photographs to be used and when should you consult your patent attorney.

In the first part of the book, the general nature of industrial property and monopolies granted to protect it are discussed; the second part, a practical method of insuring this recording of dates is presented in a series of a dozen forms. A final chapter deals with the method of patent investigations.

## Manual Solves Practical Mathematical Problems

*Mathematics at Work*, by Holbrook L. Horton; simulated leather, 728 pages, 6 x 9 inches; published by Industrial Press, New York, for \$6.00.

Practical applications of arithmetic, algebra, geometry, trigonometry and logarithms are illustrated by a wide variety of mechanical problems taken from actual practice in this book, intended for machine designers, tool engineers, gage designers, mechanical draftsmen, etc. These problems are analyzed and solved in an easy-to-follow, step-by-step procedure. Each problem is presented in such a way as to show what the problem is about, how to analyze it and develop a method of attack and solution, what formula, if any, is required, how this formula is derived and how a typical example is worked out.

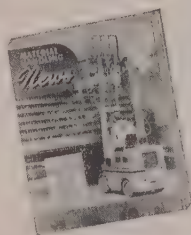
Problems illustrating some com-

# MATERIAL HANDLING *News*

Special metal containers, mounted on skids, holding approximately 5000 pounds of scrap are easily handled by a husky Clark Utilitruc. Fork-truck speed and versatility are particularly valuable in handling metals



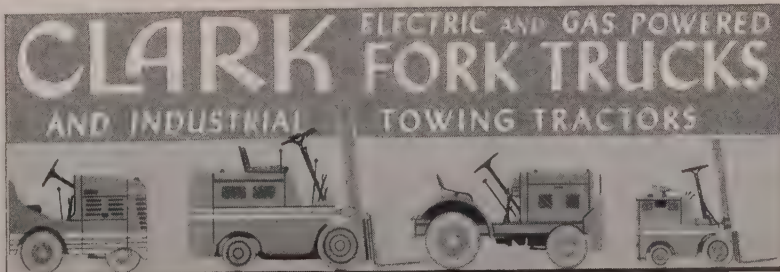
No need of a pallet in handling big castings or other bulky units. There's practically no limit to the number of daily chores in a metals plant that can be performed quickly, safely and at remarkably low cost by Clark's 1000-lb. Trucloader



WRITE FOR  
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Handling News*  
—"must" reading.

## TACKLE THOSE HANDLING COSTS!

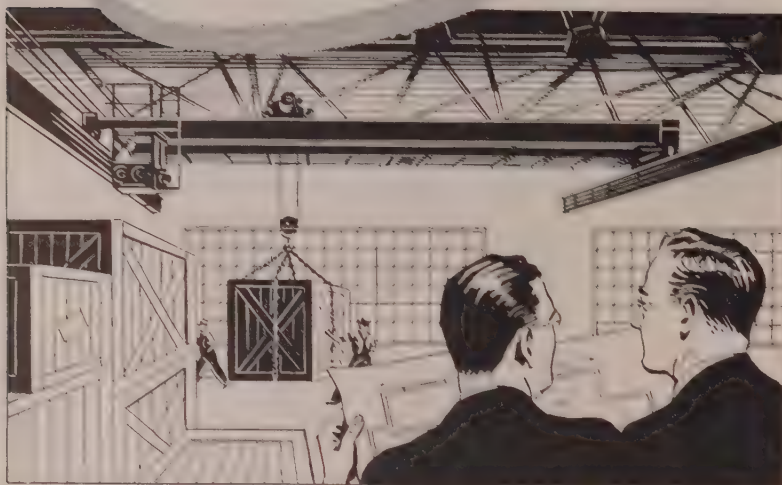
It is one of the surest ways to protect and increase profits, say Industry's wisest counsellors; and one of the few remaining opportunities for appreciable savings. The Clark Method expands the capacity of any business by speeding up the flow of material. It increases storage capacity without plant expansion. It minimizes demurrage and costly accidents. It is good common-sense—and now is the time— to CONSULT CLARK.



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"When we decided to build, you can bet we planned in advance against the possibility of a future need for greater crane capacity."

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mon mathematical principle or method have been grouped together, the classification making it easy to find the general type of problem at hand or one closely paralleling it. A reference section consisting of five chapters provides a concise and clear review of the practical fundamentals of arithmetic, algebra, geometry, trigonometry and logarithms. Included are 145 pages of standard mathematical tables, including logarithmic and trigonometric tables. Use of diagrams is made, where appropriate.

## Steel, Timber Structural Problems Detailed

*Elementary Structural Problems in Steel and Timber*, by C. R. Young and C. F. Morrison, published by John Wiley & Sons, Inc., New York.

Third edition of this book provides practical, detailed solutions to problems involving design of beams, girders, trusses and other timber and steel structures. The authors, engineering professors at the University of Toronto, have also been consulting engineers for many years.

## Industrial Engineering Dictionary Published

*Industrial Engineering Dictionary*, flexible cover, 74 pages; published by Industrial Engineering College, Chicago, for \$2.00.

The Chicago Educational Institution has published, after five revisions and much research, along with collaboration with prominent management and industrial engineers, this industrial engineering dictionary. It has over 500 words, terms and phrases, and many abbreviations used in the profession. Having a flexible cover and three posts, it can be supplemented and used for additional information.

## Book Contains Practical Course in Patent Law

*Patent Law for the Executive and Engineer*, by H. A. Toulmin, Jr., cloth, 231 pages, 5½ x 8 inches; published by Research Press Inc., Dayton, O., for \$2.95.

How to get patents, how to use them and how to protect the rights they provide are among the subjects covered in the second edition of this book, brought up to date in conformance with the latest decisions of the U. S. Supreme Court. Questions answered include what is the relationship of patents in the income tax, what records of invention must be kept, how to avoid infringement, does keeping an invention a secret prevent it from being patented

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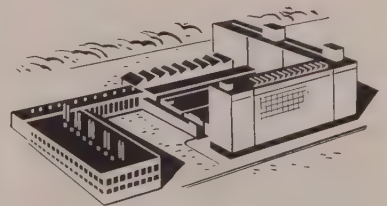


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# 1 truck-man CUTS

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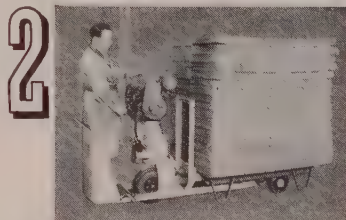
### DO 4 OUT OF 5 JOBS!

Cut your handling costs with Truck-Man! Owners say: "Replaces two or more men . . . pays for itself!" Each designed 'round famous Power Turret. Untrained workers operate easily. Rugged construction . . . carries up to 3,500 pounds. Truck-Man working for you means . . . time saved . . . more material moved . . . satisfied employees. "Ask any operator!"

**Model DF Pallet Toter.** Ideal for economical, fast, horizontal pallet movement or as feeder for heavy stackers. Weight empty, 920 pounds . . . load rating, 3,000 pounds! Carries same load as expensive units five times its weight! Turns in own length.



**Model D Skid Lift.** Hauls over 1½ tons; 2 speeds, simple compact controls. Highly maneuverable in small spaces. Hydraulic lift, pneumatic tires on drive wheels, 9" x 4" rubber-tired load wheels protect floors. Does work of units costing five times as much.



**Model DT handy Platform Utility** for all 'round use. Ideal for shipping departments, baggage handling, as mobile maintenance shop or plant fire fighting unit. Light, speedy, economical, generous deck space. Platform 36" x 66", overall length 108", 1,500 pound capacity. Four 6-ply pneumatic industrial tires.



All Three Models

**\$850**

F.O.B. Jackson

All 3 Have . . . Wisconsin Heavy Duty air-cooled gasoline engine. All three give you:

- Round-the-clock operation . . . no layups for battery charge . . . no battery charging equipment to buy.
- Economy . . . average eight hours on a gallon of gas.
- U/L approval . . . simplicity—safety—stamina! "And the operator rides with the load!"

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**truck-man** INC., 1401 W. Ganson, Jackson, Mich.

Send me information on the Truck-Man models checked below:

☐ Hydraulic Skid Lift ☐ Pallet Toter ☐ Platform Utility

Name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_ Street No. \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

and how does one find what others have done in the patent field before he files for patent application.

The book is written by a lawyer, counsel for many leading corporations, out of his experience as a corporation and trial lawyer. It attempts to show the reader how to develop and protect his inventions so that he can succeed to make them profitable. It relates how he can make money from the inventions, without interference, to which their merit entitles him.

## Machine Kinematics Text Includes Applications

*Kinematics of Machines*, by Arthur F. MacConochie, professor of mechanical engineering, University of Virginia; cloth, 217 pages, 6¼ x 9¼ inches; published by Pitman Publishing Corp., New York.

Preface of the book states that the author's many years of experience in the presentation of the subject and his extensive association with the engineering industry have strengthened the conviction that descriptive superficiality is no substitute for thorough understanding. With these convictions in mind, the author included applications to practice that serve the subordinate purpose of illuminating the basic concepts of geometric association, velocity and acceleration.

No apology is given for introducing the reader to the notion of the relativity of space and time. The author states that year by year engineering and physics are becoming more and more closely identified; the time has gone by when one could assume that the engineering graduate would never have occasion to consider velocities greater than the mile per second achieved in 1918 by the projectile of the Paris gun. The well-illustrated and diagrammed book is divided into eight chapters, including the elements of mechanism, geometry in mechanism, velocity in mechanism, acceleration in mechanism, and kinematics of simple machine elements.

## Gas Welding, Cutting Applications Explained

*Gas Welding and Cutting*, by C. G. Bainbridge; cloth, 305 pages, 5½ x 8½ inches; published by Iliffe & Sons Ltd., London, England.

This book is not intended to be a review of industrial employment of welding and cutting, except where it is desired to show some particular point of procedure. More attention has been paid to the desirability of providing essential and instructive illustrations of technique and methods.

It is a book for the practical welder and those responsible for gas welding and cutting operations involved in the fabrication, repair or maintenance of metal parts, or the installation of piping and other equipment. Covered are most of the applications of gas welding and cutting.

Between its covers are 186 illustrations and 55 tables. The author states that he is aware of the fact that a knowledge of welding cannot be acquired from textbooks alone. But he believes that a clear understanding of the underlying principles of the methods and techniques involved is essential if a welder's work is to be entirely successful. He has kept this in mind in writing the book. Gases and equipment, principles of gas welding, welding wrought metals and castings, rebuilding worn parts, cutting with oxygen and workshop examination of welded joints are among the subjects covered.

## 80-Factory Survey Used in Time Study Book

*Motion and Time Study*, by Dr. Ralph M. Barnes, professor of industrial engineering, University of Iowa; 560 pages; published by John Wiley & Sons, Inc., New York, for \$5.00.

A survey of 80 factories throughout the country was conducted by the author to obtain the latest and most successful motion and time study techniques before completing his manuscript. Findings of this survey are incorporated in the book along with a complete revision of the material of the previous edition.

Five new chapters on process analysis, gang process charts, activity charts and man and machine charts have been added to this third edition. Two appendixes telling how to set up a work methods training program are also new in this edition. The author is one of the pioneers and recognized authorities in motion and time study research, having begun his work before the methods and applications of this branch of industrial engineering were in common use.

## Guide Covers Jig and Fixtures Design, Use

*Jigs and Fixtures*, by Fred H. Colvin and Lucian L. Haas; cloth, 410 pages, 6¼ x 9¼ inches; published by McGraw-Hill Book Co., Inc., N. Y. for \$4.50.

A reference book showing many types of jigs and fixtures in actual use and giving suggestions for various uses, the fifth edition of this guide answers questions on what is standard practice in large shops and

## ON THE ROAD TO FINAL FINISH



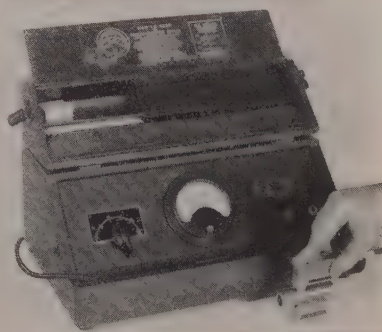
CHANCES ARE that on *any* job, the series of operations by which you obtain final finish was arrived at by the cut-and-try method—primarily because nobody knows for *sure* just what is contributed to final finish by any given step in the series.

This method obviously gives desired results, but often at *unnecessary cost*. For instance—

Time after time, surface roughness measurements made with the Profilometer after each operation prove that some operations contribute *nothing* toward final finish. In fact, many times this instrument shows that some “essential” operation actually makes the surface *rougher* instead of smoother.

The Profilometer will show you clearly and quickly, right at the machine, exactly what microinch finish you're getting at each step. Thus, with the Profilometer, you can eliminate unnecessary operations—gain closer control of each step—get the desired finish *much faster, and at much lower cost*.

*In ALL cases where surface finish is a factor, it will pay you to investigate the practical advantages offered only by the Profilometer. Write today for descriptive bulletin — without obligation, of course.*



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PHYSICISTS RESEARCH COMPANY

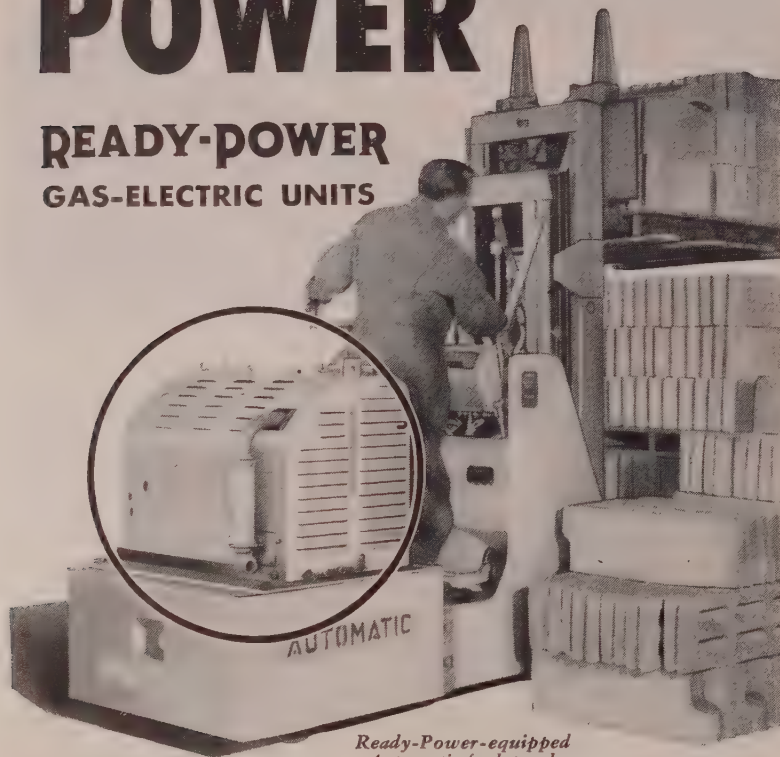
ANN ARBOR

MICHIGAN



# PLENTY OF POWER

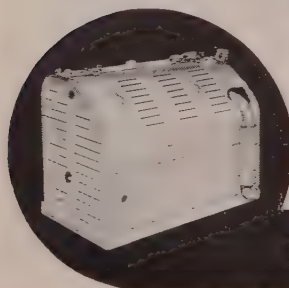
## READY-POWER GAS-ELECTRIC UNITS



*Ready-Power-equipped  
Automatic fork truck*

There is only one way to provide plenty of power for an electric truck—wherever and whenever needed—and that's to generate it constantly right on the truck chassis. Ready-Power gas-electric Power Units do just that, and do it efficiently and economically hour after hour, day after day. Specify Ready-Power on new truck purchases. Write us direct for information on converting present equipment to Ready-Power.

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Crescent platform truck  
with dump hopper*



THE **READY-POWER** Co.

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shows how to adopt these practical methods for use. Included are such new data as the new standards for drill job bushing, on airplane assembly fixtures, on special fixtures for welding for mass production, and on special fixtures for use in railway shop.

Each item entering into the proper design of jigs and fixtures is given attention, such as arrangement of views, lines and line work, dimensioning, screw-thread representations for bolts and threaded parts, etc. The book, with many illustrations and representative jig designs, is divided into six sections: Standardizing fixture design, details in fixture design, accuracy in drilled holes, methods for production milling, handling large subassemblies, inspection and toolroom systems.

## Aluminum Die Casting Design Outlined

*Designing for Alcoa Die Castings*, cloth, 188 pages, 5 3/4 x 8 1/2 inches; published by Aluminum Co. of America, Pittsburgh, for \$1.00.

Outlined in the book are the basic principles that the buyer of light-metal die castings can use advantageously. Data on the casting process and equipment, the alloys, design rules and brief discussions of machining and finishing die castings are included. Advantages offered by aluminum and magnesium die castings, such as low cost, light weight, high conductivity, permanence of dimension, ability to support sustained loads and freedom from deterioration at elevated temperatures are described.

Rapid growth of the die casting industry has paralleled the increased use of light materials. Although conferences with engineering representatives of the die caster are frequently desirable and sometimes necessary, the purchaser is in a better position to work with the supplier if he has the fundamental facts available for reference, such as are included in this book. Extensive use is made of photographs and diagrams. A chapter on inspection and testing and a glossary of die casting terms are included.

## Steel Buildings Book Revised

*Design of Steel Buildings*, by Harold D. Hauf and Henry A. Pfisterer; published by John Wiley & Sons, Inc., New York.

The book, now in its third edition, has been rewritten and brought up to date to conform with the 1946 revision of the American Institute

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**NOW--**

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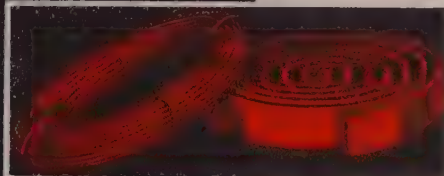
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The policy pursued for three-quarters of a century -- "never forget" to keep well ahead of the needs of alert, progressive manufacturing establishments of the country -- is as much the policy here today as it was when Grant was inaugurated!

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Manufacturers from coast to coast know how important **DETROIT POWER SCREWDRIVERS** are where assemblies are fastened with screws . . . what a great saving in time and labor. You, too, should consider them now. There are three models to drive screws from No. 2 to  $\frac{5}{8}$  at the remarkable speed of one a second. There is a **DETROIT POWER SCREWDRIVER** to solve your production problem.

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of Steel Construction specifications. An expanded treatment of welded construction is also included. Both authors are consulting engineers and members of the architectural engineering faculty at Yale University.

## Mathematical Calculation As Used in Inspection

*Precision Measurement Methods and Formulas*, by Jack Johnson, quality control adviser; cloth 181 pages,  $6\frac{1}{4} \times 9\frac{1}{4}$  inches; published by Pitman Publishing Corp., New York.

Author has attempted to treat the subject of precision inspection in such a manner as to bridge the existing gap between what is commonly called "school teacher theory" and the practical down-to-earth problems that confront the inspector in his tool work. The problems presented in this book have been drawn directly from the shop and the accompanying solutions are carried through step by step so that no phase of the solution is lost and yet, through the use of a great number of setup drawings and sketches, the overall theory behind the solution is in most cases clearly and unmistakably shown.

Uses of balls, disks or pins in determining the answers to problems are demonstrated. Formulas presented are selected as representative of the many problems encountered by an inspector. The principles of trigonometry have been applied to the field of precision inspection and the book shows the inspector and the toolmaker the practical application of that simple geometric figure, the triangle. The book makes liberal use of line drawings.

## Common Sense Major Element in Steel Treating

*Common Sense in Steel Treating* by W. R. Bennett; paper, 68 pages,  $5\frac{1}{4} \times 7\frac{1}{2}$  inches; published by W. R. Bennett, Brattleboro, Vermont.

The author states in his preface that the book is presented for the purpose of solving the difficulties constantly cropping up in the daily life of the man whose duty it is to harden steel. The book does not offer a preponderance of subjects having no direct bearing on present difficulties. It does deal with specific problems causing trouble and points out the dangerous steps and advises methods to eliminate them, thus preventing their recurrence.

Book starts out with chapters on know your steel, sparking steel to determine types, annealing, temperature control and heating for hardening. The reader will also find cover-

age of such subjects as shrinking carbon steel drawing dies, vibration transmission in quenching, annealing high speed steel, heating high speed steel for hardening, high speed heat determination without pyrometer aids, wet nitriding and roll threading dies among its many sections.

## Arc Welding Progress In the Postwar Years

*Design for Welding*; cloth, 1024 pages, 5½ x 7½ inches; published by James F. Lincoln Arc Welding Foundation, Cleveland, for \$2.00.

Prepared with the purpose of making available a record of representative welded designs, the book is composed of abstracts of 82 award papers in the recent foundation Design-for-Progress award program. Emphasis has been placed on projects produced and in co-operation with the objective of providing engineers and industry generally with a variety of ideas which may be adaptable to their own products or structures. A liberal presentation of cost data on the various designs affords a sound means of making a comparative study of methods.

Book is profusely illustrated with photographs and contains numerous drawings and tables. Papers included in the book are classed in the following categories: Aircraft, automotive, railroad, watercraft, containers, furniture, structures, machinery and welderies. Each section contains papers describing outstanding accomplishments in that particular field.

## Hydraulic Institute Standards Revised

*Standards of Hydraulic Institute* (Eighth Edition); paper, 8½ x 11 inches; published by Hydraulic Institute, New York, for \$3.00.

Publisher of the standard, the Hydraulic Institute, is a trade association comprising the principal manufacturers of displacement and centrifugal pumps in the United States. It co-operates with various government departments and technical societies and other technical and commercial organizations with which the pump industry has problems in common.

This publication is divided into six sections: General, data, centrifugal pump, rotary pump, reciprocating pump, and an entirely new section containing tentative standards on pipe friction. The sections covering the three broad classifications of industrial pumps each have their own test code. Contained in each section are appropriate tables, graphs, and illustrations.



## Why Sprinkler Inspections Are All Important

YOU MAY HAVE the best sprinkler system available, but how sure are you of its readiness and ability to combat fire? After all, a sprinkler system, like any other mechanical device not properly maintained, may fail at its time of need. That could mean bad news to you, Mr. Property Owner. That's why you should know of the primary advantages of *"Automatic Sprinkler Inspection Service."*

Realizing the vital importance of assured sprinkler system operation, *"Automatic Sprinkler"*, at the advent of its business some 55 years ago, established an **Inspection Service Department**. **Inspection Service**, which is handled only by individuals thoroughly familiar with all types of sprinkler equipments, actually augments periodic insurance bureau inspections and provides you with a double check on the general efficiency of your fire protection equipment.

**Inspection Service** detects minor irregularities and provides for correction before major repairs are necessary. It brings to your attention the need of extensions to your present equipment should property expansion so demand. In short, *"Automatic Sprinkler Inspection Service"* is an integral factor in every over-all fire safety program and its true value worth considerably more than is the small annual charge that is made for it.

Don't wait for fire to strike and then hope for the best. Be assured through **Inspection Service** that your fire protection will really protect, today—tomorrow—next week or whenever it is needed. "Automatic" Sprinkler Corporation of America, Youngstown 2, Ohio.

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OFFICES IN PRINCIPAL CITIES OF NORTH AND SOUTH AMERICA



# Quick Acting JOHNSON FURNACES

## REDUCE TOOLROOM BOTTLENECKS

**Heat treat high speed steels, tools and dies in your own plant at low cost**

Reduce unnecessary lost time waiting for tools and dies. Heat treat high speed steels, harden high carbon steels, braze carbide tipped tools in your own plant. *Quick Acting* JOHNSON Hi-Speed Furnaces are ready for action to produce high uniform temperatures FAST and at remarkably low cost. Pay for themselves by saving time and gas. Wide temperature range easily regulated with accuracy. Write today for complete literature describing all *Quick Acting* JOHNSON Furnaces. There is a size to meet every toolroom requirement.

Furnaces described are complete with Carbofrax Hearth, G. E. Motor, and Johnson Blower.



### QUICK ACTING

JOHNSON No. 120 Hi-Speed  
1500° F. in 5 Minutes  
2300° F. in 30 Minutes  
Firebox 5 x 7 $\frac{1}{4}$  x 13 $\frac{1}{2}$ . Two burners  
\$145.50 F.O.B. Factory

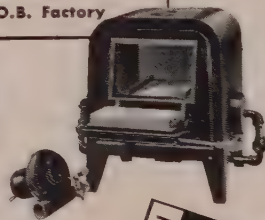


### QUICK ACTING

JOHNSON No. 70 Hi-Speed  
Bench Furnace  
2250° F. in 30 Minutes from a cold start.  
Treats all steels. Firebox 5 x 7 $\frac{1}{4}$  x 9.  
Two burners  
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### QUICK ACTING

JOHNSON No. 130A Hi-Speed  
For steels requiring 1400-2350° F.  
Firebox 7 x 13 x 16 $\frac{1}{2}$ . Four burners.  
\$295.00 F.O.B. Factory

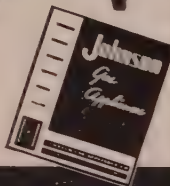


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## Carbon Concentration

(Concluded from Page 109)

and acceptable core toughness, at the same time often eliminating subsequent machining operations. Ability to increase the surface carbon well above that of the core also makes parts produced from the carbon corrected bars comparable with carburized parts in some instances.

Direct cost comparisons indicate that, under present conditions, the surface corrected bars will usually prove more economical than other types for sizes up to at least 1 $\frac{1}{2}$  inches, due largely to the savings afforded by simplifying or eliminating subsequent operations required to produce the finished parts. Obviously a study of both the metallurgical factors and material costs involved in each application is necessary before any final decision as to which material is more desirable can be made.

## Publishes Resistance Measuring Booklet


To obtain accurate results with resistance measuring bridges, some knowledge of their practical limitations is needed by all users. To meet this demand, the National Bureau of Standards, Washington, has published a booklet entitled "Precision Resistors and Their Measurement", which gives a systematic discussion of the characteristics of precision resistance apparatus and the Bureau's methods for measuring resistance.

Although intended primarily for workers with only general training in electrical measurements, the information included is of significance to anyone interested in the accurate measurement of resistance. Designated as Circular 470, the pamphlet contains chapters on resistance materials and construction methods, methods of comparison of resistors, special apparatus for precision measurements, calibration of precision bridges, and resistivity of solid conductors.

—O—

Bibliography released by Office of Technical Services, Department of Commerce, Washington, D. C., contains 255 atomic energy reports. It supplements an earlier report, PB 87782. The supplement, PB 87782-S, and the original report cover subject matter freed from security restrictions by American and British agencies. Photostats or microfilms of all documents are available.





**Motor-Makers Know that**  
**AMERICAN**  
**PHILLIPS SCREWS**  
*put up a "Good Show"*

## On the Production Floor... and Sales Floor, too!

**GOOD SHOW IN PRODUCTION:** Assembly rolls along smoothly in high gear, with fastenings made by American Phillips Screws that turn up straight and tight *every time* . . . with never a slip or a slash to spoil costly enameled surfaces. Workers do more and better work, far more easily, than they ever did with out-of-date slotted screws. *And time savings run as high as 50%.* That's why so many million American Phillips Screws are used in automotive plants *every month*.

**GOOD SHOW IN SALES:** The modern mark of American Phillips' cornerless, crossed recess is one of the quality insignia of top cars and trucks . . . a feature looked for and recognized by customers. It means no unsightly burred heads to mar sales appeal or snag clothes and hands. And it means extra vibration-resistance to keep bodies tight and squeak-free. Does *your* product have this double-feature of production-economy and sales promotion? Then write:

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Detroit 2: 502 Stephenson Building

4-WINGED DRIVER CAN'T SLIP OUT  
 OF PHILLIPS TAPERED RECESS

**AMERICAN**  
**PHILLIPS** *Screws*



**ALL TYPES**

ALL METALS: Steel,  
 Brass, Bronze, Stain-  
 less Steel, Aluminum,  
 Monel, Everdur (sil-  
 icon bronze)



# Binks pressure material tanks of every size and type



for immediate delivery

NOW . . . for the first time since the war, you can have immediate delivery of Binks pressure material tanks. We suggest that you take prompt advantage of this opportunity and order the material tanks your finishing department has been waiting for.

All the Binks pressure tanks described on pages 49 to 64 of our catalog are included in this opportunity. These tanks range from 2 to 60 gallons, for use with paint, lacquer, ceramic materials, viscous materials, and others.

Use of Binks pressure material tanks assures high quality of finish through constant and accurate control of material. With shells of seam-

less drawn steel, galvanized inside and outside, these tanks handle working pressures up to 110 pounds. Steel bands welded to concave bottoms provide solid support.

Cadmium plated pressed steel removable lids are held securely by "C" type clamps. Top or bottom outlets. Hand or motor-driven agitators. All Binks material tanks meet A.S.M.E. specifications.

## Let us have your order right away

If you do not have a Binks catalog available we will be glad to give you complete information and prices on any type or size of tank by mail or phone. Orders will be filled in the order in which they are received.

60 Gallons Top Outlet



30 Gallons Top Outlet



15 Gallons Top Outlet



2 Gallons Top Outlet



5 Gallons Top Outlet



10 Gallons Top Outlet



These tanks are also available with bottom outlets

"Binks equipment must do everything you expect of it—and do it better."

*J. P. Roche*  
President

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## Russian Ore Prospecting Papers Released

Prepared in conjunction with the Geological Survey's program of research on the analysis of soil, vegetation and water as a method of locating buried mineral deposits are six translations of Russian articles on geochemical prospecting for ore. Copies of these translations have been placed on open file and may be examined at Geological Survey offices in Washington, D.C., Knoxville, Tenn., Madison, Wis., Denver, Colo., Spokane, Wash., and San Francisco, Calif.

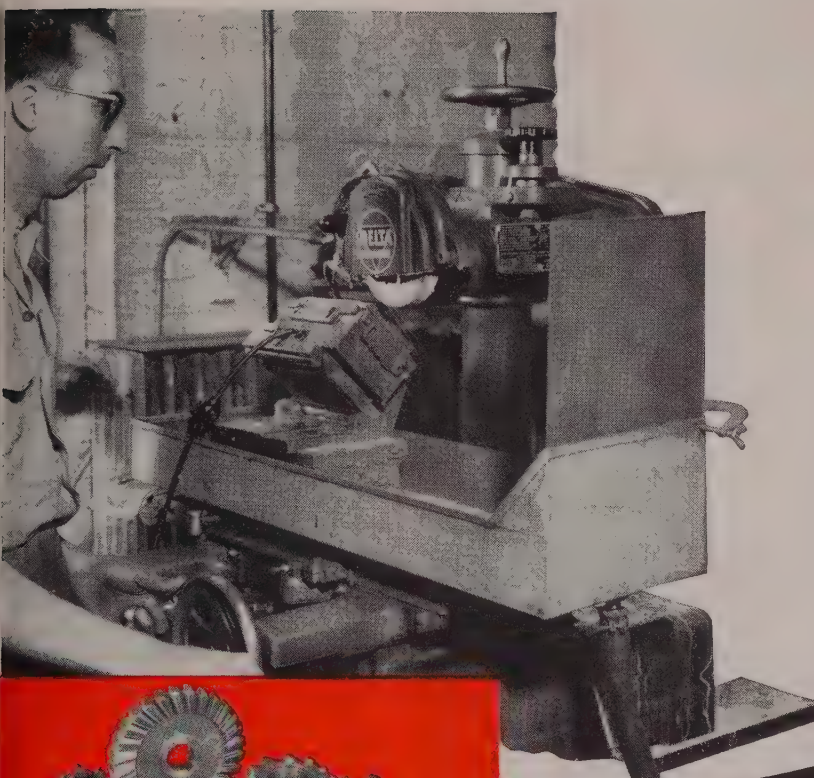
A list of the titles is as follows: Field spectroanalytical laboratory for servicing prospecting parties; geochemical method of prospecting for ore deposits; water analysis as a means of prospecting for metallic deposits; a new luminoscope for field use; ionic or electrode polarization method of geophysical prospecting; physico-chemical method of prospecting for molybdenum in the semidesert climate of the northern Lake Balkhash area.

## Composite Steel, Aluminum Bridge in Use

Recently opened to traffic in Great Britain was a bascule type of road and rail bridge built of aluminum alloy. This bridge, at Hendon dock junction at Sunderland harbor, was designed for maximum loads of 70-ton bogie on two axles for the railroad track and a 75 ton trailer on two 4-wheel axles for the roadway. Actually the bridge is a composite structure in which the fixed spans are mild steel, but the movable spans, except the kentledge boxes, are aluminum alloy. The span of the bridge allows for a clear opening of 90 feet to the dock and the distance between the trunnion is about 120 feet.

Design, construction and erection of the bridge was by Head, Wrigglesworth & Co. Ltd., Thornaby, Stockton-on Tees, and the aluminum alloy plate was processed by Head Wrigglesworth Machine Co. Ltd., Middlesbrough. Total weight of the aluminum alloy used in the movable spans is 51 tons which results in a reported savings of weight of 50 per cent. The aluminum alloy used for the plates has an ultimate strength of 25 tons per square inch and proof stress of 15 tons per square inch. Plates and sections were supplied by the British Aluminum Co. Ltd. and the Northern Aluminum Co. Ltd., after consultation





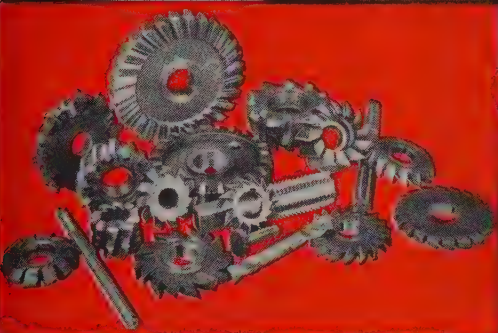
## Delta Toolmaker<sup>†</sup> Surface Grinder

Shown at left working on a lathe bit. Has wide graduations on micrometer, for close settings. Unique wheel adapter saves time and redressing. Many other features. 7" x 1 1/2" wheel, 1 1/4" bore. With simple attachments, this versatile machine becomes an efficient tool-and-cutter grinder or a chip-breaker grinder.

No. 24-105

**\$375\***

without wheel,  
motor, or switch.



You can sharpen all these — and more —  
with Delta grinders.

# These DELTA<sup>®</sup> machines cut grinding costs for toolroom and production work

Delta Grinder with Twin-Lite Safety Shields — Twin-Lite Safety Shields act as "built-in goggles," flooding your work with light. Fully-machined tool rests. Balanced wheels. Lubricated-for-life ball bearings. No. 23-405 — Complete with safety shields, lamp bulbs, wheel guards, and wheels. — \$114\*



Delta Carbide Tool Grinder—Combined with Delta's standard tool grinder for hogging down the shank steel, this machine gives you a perfect working combination for sharpening tungsten carbide tools. No. 23-555 — Complete with lamp attachment, water pot, and wheels — \$154\*



You would expect to pay much more for the all-around high quality you find in these low-cost Delta grinders. Delta's advanced engineering helps make industrial grinding easier, cheaper, and extremely accurate. Plant owners, superintendents, and engineers everywhere can tell you that.

Delta grinders are available in both bench and floor models—with current and speeds to suit any requirement. Simple, easily-adjusted attachments

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Univiset—The first truly universal vise for grinding, drilling, and milling. With coolant attachment, converts Delta Toolmaker Surface Grinder to accurate Chip-Breaker Grinder. See details in Delta catalog A-48.

increase the utility of these machines. Your nearby Delta distributor has these popular grinders on display now. Inspect them there. Ask about buying on easy credit terms.

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Look for the name of your Delta distributor under "Tools" in the classified section of your telephone directory.

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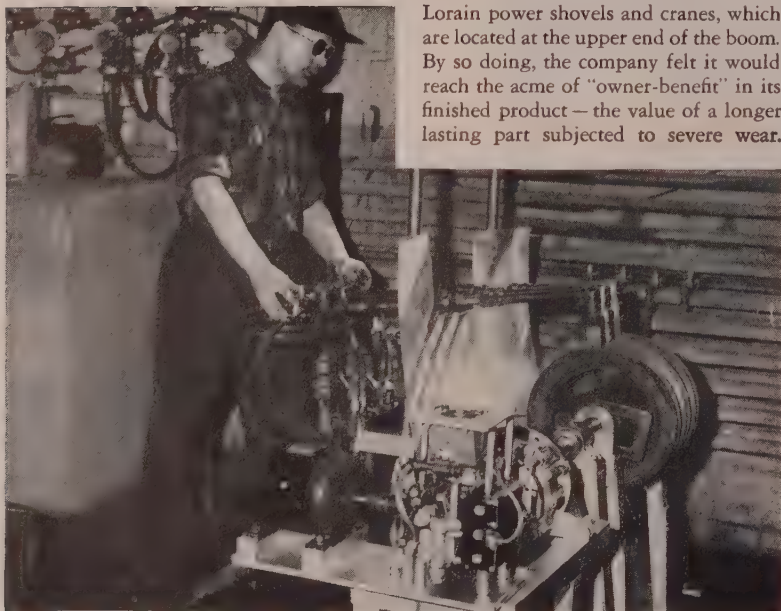
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M-36



# Product "customer-value" built up with flame hardening

**THE THEW SHOVEL COMPANY,** Lorain, Ohio, wanted to improve the wearability of the sheave throats on Lorain power shovels and cranes, which are located at the upper end of the boom. By so doing, the company felt it would reach the acme of "owner-benefit" in its finished product — the value of a longer lasting part subjected to severe wear.



**A. B. Neiman**, Airco Technical Sales Representative, recommended oxyacetylene flame hardening. With this modern process, hardening could be localized to the sheave throat, *without* affecting the balance of the sheave's ductility. This was highly important for finished machining. Using a set-up of three Airco No. 4383 torches, with hardening tips especially designed for this job, three sheaves are simultane-

ously hardened to a predetermined degree that insures maximum wear-resistant qualities.

Since flame hardening was introduced, the company still has gone further in its efforts to increase the customer-value of its products by expanding this modern, localized hardening process to include: gears, jaw clutches, and other parts requiring longer "in-service" life.

## TECHNICAL SALES SERVICE — ANOTHER AIRCO PLUS-VALUE FOR CUSTOMERS

To assure its customers of high efficiency in all applications of the oxyacetylene flame or electric arc, Air Reduction makes available the broad, practical experience of its nationwide Technical Sales Division personnel. The collective experience and knowledge of these specialists has helped thousands to a more effective use of Airco processes and products. Ask about this Airco "Plus-Value" service today. Write your nearest Airco office. (In Texas: Magnolia Airco Gas Products Company) . . . On West Coast: Air Reduction Pacific Company)



## AIR REDUCTION

Offices in All Principal Cities

Headquarters for Oxygen, Acetylene and other Gases . . . Carbide . . . Gas Welding and Cutting Machines, Apparatus and Supplies . . . Arc Welders, Electrodes and Accessories

with the Aluminum Development Association to decide the best type of alloy to use.

## Truck Design Simplifies Large Plate Handling Jobs

Built for handling a pack of plate glass comprised of 25 sheets,  $\frac{1}{4}$  inch thick, measuring 75 x 145 $\frac{1}{2}$  inches and weighing 6000 pounds, but also adaptable to handling large sheets of other material such as steel, asbestos and building board, is a new type of power industrial truck. Body of the truck, designed and built by Elwell-Parker Electric Co., Cleveland, is of basic lift-fork, battery-powered design. In place of a fork, there is a structural member resembling an elongated wishbone attached to the elevating and tilting mechanism in the truck's upright columns.

Head of this member is bent forward to form a short horizontal boom, which has a hook from which is suspended a steel cross-beam. Near each end of the beam is a long flexible steel cable sling, with padded stirrups for supporting the glass as it is lifted and carried. Across the main frame of the attachment and extending horizontally the width of the pack is an adjustable steel apron with rubber facing to form a backrest for the load. Packs of glass stand almost vertically on two parallel lengths of 2 x 4 wood scantlings. With the glass stored in the warehouse in this manner, it is only necessary that cable slings be placed around a pack. The truck operator controls movements of the attachment and truck.

## Control Compensates for Elevator Cable Stretch

A new control element for elevators which automatically offsets the element of cable stretching in close leveling at floors is a development of Westinghouse Electric Corp., Pittsburgh. For freight elevators this is particularly necessary since heavy wheeled loads are often moved in and out. In some buildings the cables are long enough to stretch or shorten and let the car drop or rise an inch or two as a heavy load enters or departs, possible necessitating a relevelling operation.

Because the traction motor torque does not build up instantly when the controller releases the brake to bring the car back into position the car may actually drop another inch or two or, if the load is light, even rise a like amount. The new element levels the car automatically. A load

weighing device and a control measures the load in the car and controls the release of the brake. With a very heavy load the control would hold the brake on until the elevator motor has built up sufficient torque to releve the car without further dropping; then it would release the brake.

## Welded Bridges Subject Of 1949 Lincoln Award

An opportunity for designers to submit, in competition for awards, bridge designs created specifically for welded fabrication and erection is being given by the James F. Lincoln Arc Welding Foundation, Cleveland. Through its "Welded Bridges of the Future" program, the foundation believes that new shapes can be produced if and when they are required in large quantities.

Designs are not to be limited by present structural steel shapes or by traditional methods and facilities for fabrication, the competitors being encouraged to incorporate sections of their design that are not now available, provided the designs can be improved thereby. Awards to be made are as follows: First award, \$3000; second award, \$1500; third award, \$750; honorable mention, 10 at \$100 each. Manuscripts and drawings of all exhibits to qualify as entries must be submitted prior to June 30, 1949. Complete details may be obtained from the foundation.

## Silicone Oil Adopted as Mold Release Agent


Silicone oil as a mold release agent in the injection molding of aluminum and zinc die-castings is a new application for this product announced by resin and insulation materials division of General Electric Co.'s chemical department, Pittsfield, Mass. Use of the oil, in emulsion form, is reported to facilitate production of certain type die castings and to help provide a smooth surface on the finished parts. The oil wets the mold readily, penetrates any small cavity and withstands temperatures up to 600° F. It may be applied by brushing, spraying or wiping at the consistency supplied or after dilution with various solvents.

Manufactured at the company's new silicone plant at Waterford, N. Y. the material used in die casting came as a result of highly successful use of the material as a lubricant in the molding of automobile tires and a variety of other rubber prod-

# Modern Industries

# Don't Have

# FUMES AND DUST



...they have

## Schmieg

CENTRI-MERGE

Available both as a floor-mounted type (shown) or an overhead installation. Complete with a motor-driven sludge removal conveyor, where required.

## AUTOMATIC ELIMINATION

## from Collection to Disposal

Operators of modern plants have long since learned the economy of ridding their shops of destructive dust and smoke fumes. Men who work in plants free of these health hazards feel better, work better, produce more. And the accident rate is lowered. In actual plant operation, the Schmieg CENTRI-MERGE method of dust and fume elimination has shown marked advantages over any other system. Dust and fumes are collected immediately they occur—shot back on a stream of air through ducts to the Collection Unit. In the washing chamber of this unit—a veritable tornado of seething, churning water-dust is washed and scrubbed from the air and flooded into the sludge tank below, permanently trapped under water. Fumes go out the exhaust. AUTOMATIC operation from start to finish.

If you are interested in learning why the CENTRI-MERGE method is so highly endorsed by plant owners and how its application can so greatly benefit your own operation, our engineers are prepared to give you some eye-opening information on dust and fume elimination—without obligation, of course.

THE best AIR PURGE  
is  
CENTRI-MERGE

# Schmieg

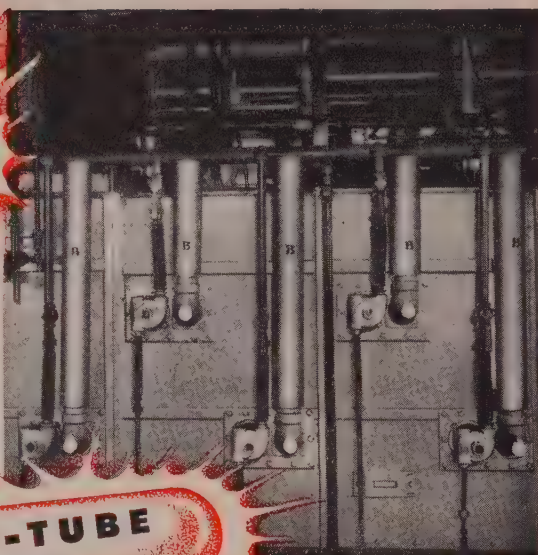
## INDUSTRIES INC.

Engineers & Manufacturers



## BLAZING THE HEAT TREAT TRAIL

The first radiant-tube continuous furnace was built by Holcroft in 1936, and is still producing efficiently. The furnace at right shows the simplicity of the Holcroft radiant-tube installation.



## RADIANT-TUBE HEATING

Applied by

**Holcroft**

in 1936 for

## LARGER FURNACE CAPACITY with GREATER ECONOMY

Introduced by Holcroft in 1936, radiant-tube heating of continuous furnaces solved the problem of constructing larger, more durable furnaces for controlled-atmosphere heat treating. This development made possible the high-production furnaces of today.

As applied by Holcroft, this heating method offers the following advantages:

→ Gas, oil or electric firing may be used, whichever is most economical.

→ Combination oil-gas burners are available, with quick changeover provided.

→ Holcroft burners are of closed-head design. Air and fuel are metered, and are progressively mixed as they pass through the tubes. This assures both maximum combustion efficiency and the uniform heating required for maximum tube life.

→ The burner design permits floating control, with the same superior performance at all rates of heat input.

→ All tubes are readily replaced without cooling the furnace; and electric heating elements are replaced without removing the tubes.

These are but typical of the many advantages provided by Holcroft engineering leadership. Each Holcroft furnace is designed individually for its specific application, and complete metallurgical and engineering service are provided. Thus Holcroft assures maximum over-all economy in production heat treat furnaces for EVERY purpose.

SINCE 1916

**Holcroft**

AND COMPANY

6545 EPWORTH BLVD.

CHICAGO 3

C. H. MARTIN, A. A. ENGELHARDT  
1017 PEOPLES GAS BLDG.

CANADA

WALKER METAL PRODUCTS, LTD.  
WALKERVILLE, ONTARIO

DETROIT 10, MICHIGAN

HOUSTON 1

R. E. MCARDLE  
5724 NAVIGATION BLVD.

ucts, plastic parts and mica, it was stated. The features of the silicone oil have made it adaptable for a variety of other applications such as an antifoaming agent in liquid systems, as a hydraulic fluid, a damping fluid and as a liquid for constant temperature baths. The oil is available in three grades with varying viscosities.

## New Products Services Compiled in Booklet

More than 1000 new products and services now ready for marketing are compiled into an 80-page new products booklet published by New York Journal of Commerce. It offers a detailed description of the innovations of more than 750 different manufacturers, classified by industry and completely indexed by name and address of each producer.

Products of over 60 different industries are included, such as food processing equipment, liquid stainless steel, prefabrication techniques, new industrial safety equipment, etc. Copies of the booklet are obtainable at 50 cents each from the New York Journal of Commerce, 63 Park Row, New York.

## Two New Tripoli Compositions Announced

Tripoli compositions of a water-soluble nature and with good working properties are being announced by Hanson-Van Winkle-Munning Co., Matawan, N. J. They are useful on work where the composition tends to pack and thus gives rise to a cleaning problem. Composition 2-S-10 is recommended for heavy duty jobs where more cut is required and maximum solubility is not the primary prerequisite.

Type 2-S-12 is very dry and is for use on filigreed work where cleaning is a real problem and a heavy cut not so essential. Both are as water-dispersible as any composition, but cutting properties and buff mileage do not quite measure up to the standard group of compositions made by the company.

## Alloying Now Classed As a Science

In a recent talk before the Pittsburgh Science of Metals Club on "Fundamental Principles of Alloying", Dr. Louis A. Carapella, senior fellow in metallurgy at Mellon Institute of Industrial Research, elucidated through the action of four basic



## CAPABLE HANDS

When "unimportant" jobs in a manufacturing plant are regarded as of no significance, important operations can very well be seriously affected.

That is why at Allied every job is important and is entrusted to capable hands. The

"end result" is a product that has received careful attention in every department—that in every way reflects Precision, Experience, Dependability.



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HARDENED AND PRECISION GROUND PARTS • STANDARD CAP SCREWS • SPECIAL COLD FORGED PARTS  
SHEET METAL DIES FROM THE LARGEST TO THE SMALLEST • JIGS • FIXTURES • STEAM-HEATED PLASTIC  
MOLDS • SPECIAL PRODUCTION TOOLS • R-B INTERCHANGEABLE PUNCHES AND DIES • DIE MAKERS' SUPPLIES

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# labor SERVING cranes wherever the heat is on!



## NORTHERN OVERHEAD ELECTRIC CRANES

With an overhead crane it is not only **QUICKER** and **EASIER** to load or unload a dolly for normalizing a bulky fabricated assembly, it is also **SAFER**. A crane is **LABOR SERVING**—saves handling time and effort.

Many such installations of **NORTHERN OVERHEAD ELECTRIC TRAVELLING CRANES**—from 1 to 100 tons capacity—have proved the values of this service.

★ Write for our Bulletin No. 127-C ★

**OVERHEAD** ★ **NORTHERN**  
**ELECTRIC CRANES** ★ **ENGINEERING WORKS**  
**AND HOISTS** ★ 2615 Atwater St., Detroit 7, Mich.

factors how an alloy composition may be selected to fit a given set of physical requirements and how properties may be predicted from composition.

Drawing from researches conducted at Mellon Institute, Dr. Carapella demonstrated the action of these four factors, namely, crystal structure, relative atomic sizes, atomic valency and electrochemical affinity, on such general alloying features as solid solution formation; liquidus, solidus and solid solubility curves; electron, intermetallic, and normal valency compounds; age-hardening effects; and order-disorder phenomena. Many properties such as mechanical, chemical, thermal, electrical, and magnetic, are specifically affected by these factors.

Rapid strides have been made, particularly over the past 25 years, in the quest for a basic understanding of the complexities of metallic behaviors. If we continue to think along these lines and explore our notions diligently and scientifically in a concerted manner, it is quite possible that a common denominator will eventually be uncovered, thereby simplifying the prevailing concepts of alloying behaviors and even expressing them, perhaps, in terms of a "single fundamental equation of metallic state". Although the attainment of this goal is an event of the near future, Dr. Carapella further emphasized that metallurgy as a science has nonetheless become of age.

—O—

An agreement with Dr. Bronislaw Goldman, Pittsburgh consulting engineer, has been signed by Engineering & Construction Division of Koppers Co. Inc., also of Pittsburgh, whereby the company will be able to furnish the Goldman agitator for industrial plant installations. The agitator, which reduces mixing or washing time of chemicals, is so constructed that it propels liquid to the sides of the tank and upward where it is then drawn to the center and pulled downward through a hollow axis and expelled to repeat the process.

—O—

"Employee Benefit Plans and Collective Bargaining" is the title of Personnel Series No. 123 booklet, published by American Management Association, New York. Walter J. Couper of the staff of Industrial Relations Counselors Inc. authored one chapter, subject of which is "Collective Bargaining on Pensions and Other Employee Benefit Plans". The

second of the booklet's three chapters: "Benefit Plans Under Collective Bargaining—Problems and Prospects"; it is written by W. H. Winans, industrial relations manager, Union Carbide & Carbon Corp. Final chapter is by Maj. Lewis B. Hershey, director of the new Selective Service System and is entitled "The Implications of the Selective Service Act of 1948 to Personnel Administration".

## Uniform Tungsten Powders Made for Carbide Tools

Control of fine tungsten powder particle size and distribution, heretofore possible only by time-consuming research laboratory control, has now been attained on a commercial production basis, according to Tungsten and Chemical Division of Sylvania Electric Products Inc., Towanda, Pa. Over 75 per cent of the individual particles measure below 5 microns, or about 4/100,000-inch in diameter, making it possible to meet tool-makers specifications without varying their specifications.

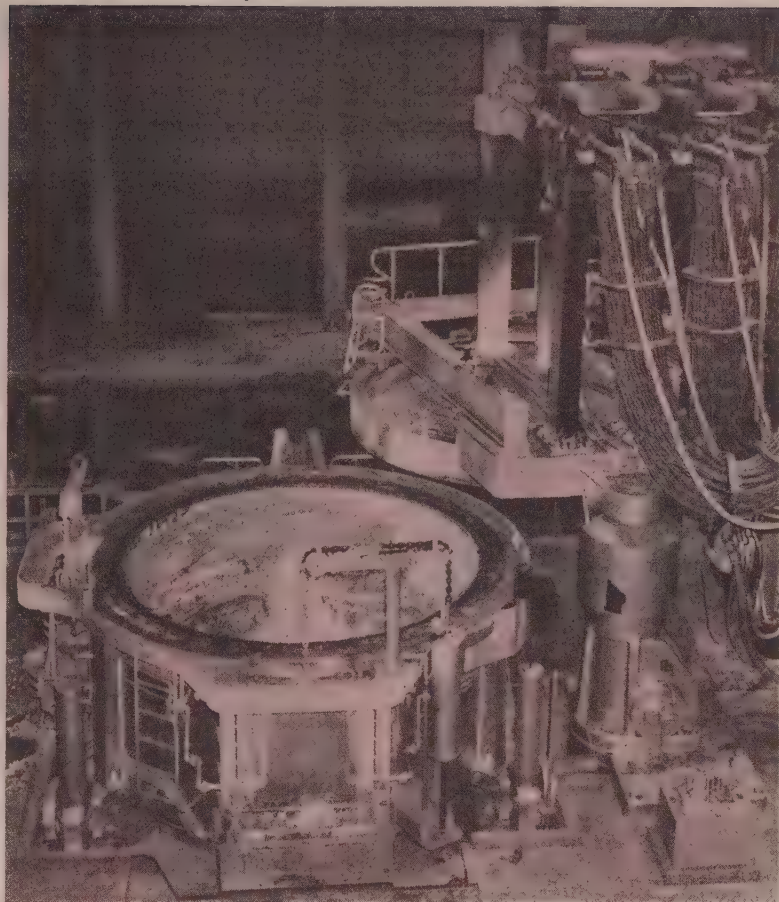
Carbide cutting tools are made by pressing and firing carburized tungsten to which cobalt is added as a binder. Size and distribution of powders must be accurately controlled for a uniform end product which is, as the company states, a solution of hard particles in cobalt, the cementing agent.

## Device Measures Force

Three manufacturers of dynamometers—General Electric, Westinghouse and Dynamatic Corp.—incorporate the Thrustorq air-operated force-measuring device in dynamometers of their manufacture, according to Hagan Corp., Pittsburgh, maker of the device. Introduced about 3 years ago, it uses a flexible diaphragm as one face of an airtight chamber into which compressed air is admitted through a pilot valve. The force to be measured is applied to the outside of the diaphragm and is opposed by internal pressure. As external force increases, the pilot valve opens and admits more air to balance the increased external force. Thus pressure within the chamber provides a direct measure of the externally applied force, the instrument makers explain.

—O—

National Screw Machine Products Association, Cleveland, has issued a new color code chart which represents the most practical combination of bar numbers and color types as used in the screw machine products industry, steel mills and warehouses.



Take a good look at the shell of this size KT Moore Rapid Lectromelt Furnace. Here is one of the reasons for Lectromelt's vast superiority in the electric melting furnace field. The shell is built with proper proportion to permit operation with a comparatively shallow bath of large area—and provides a large slag-bath ratio for efficient refining. Then, too, the height of the side plates are sufficient to permit full furnace loading with one charge with many types of scrap. Two examples of many Lectromelt efficiencies.

Moore Rapid Lectromelt Furnaces are supplied in capacities ranging from 250 pounds to 100 tons. For full details, write today for the Lectromelt catalog.

## PITTSBURGH LECTROMELT FURNACE CORP.

PITTSBURGH 30, PA.

manufactured in: CANADA, Lectromelt Furnaces of Canada, Ltd., Toronto 2; ENGLAND, Birlec, Ltd., Birmingham; SWEDEN, Birlec Elektkougmar A/B, Stockholm; AUSTRALIA, Birlec Ltd., Sydney; FRANCE, Stein et Roubaix, Paris; BELGIUM, S. A. Belge Stein et Roubaix, Bressoux-Liege; SPAIN, General Electrica Espanola, Bilbao; ITALY, Forni Stein, Genoa.





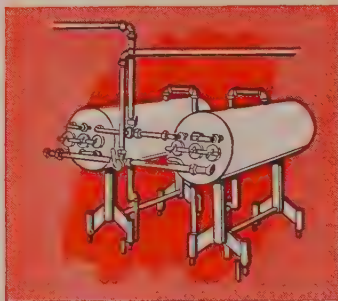
# "Standard" EXCELS IN SOLVING TOUGHEST STAINLESS TUBING PROBLEMS

*Bring us yours*

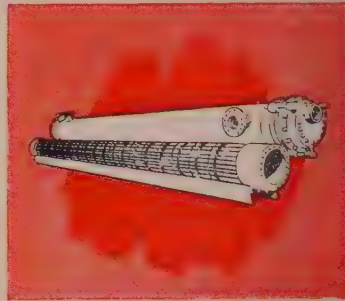
Never in 25 years has the demand for "Standard" welded steel tubing and "Standard's" unsurpassed services in tackling toughest tubing problems been so great. Whether yours is a problem of fabricating—(bending, flaring, flanging, swaging, upsetting or welding)—or of selecting analyses or tolerances, "Standard" is ready to consult and assist you.



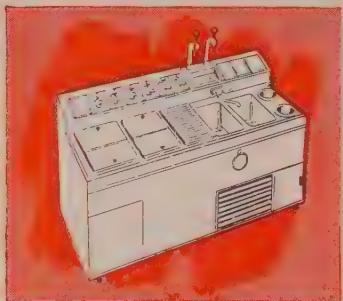
IF YOU HAVE A PROBLEM in Stainless tubing for use in bus, trolley or railroad car, consult with "Standard" experts in tubing "know-how."



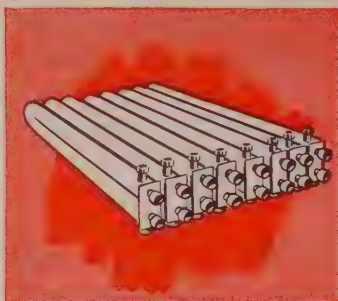
IF YOU HAVE A PROBLEM in Stainless tubing for dairy processing equipment, "Standard" can tell you the best solution for best results.



IF YOU HAVE A PROBLEM in Stainless tubing for heat exchangers in chemical and other process plants, call on "Standard" to help you.



IF YOU HAVE A PROBLEM in Stainless tubing for use in soda fountain and beverage dispensing units, let us work out the best answer.



IF YOU HAVE A PROBLEM in Stainless tubing for use in the transmission of corrosive fluids, "Standard" is fully experienced in solving it.



IF YOU HAVE A PROBLEM in Stainless tubing in high temperature applications for aircraft and other uses, "Standard" will help you most.

**"STANDARD" HAS THE EXPERIENCE AND FACILITIES TO HELP SOLVE YOUR TOUGHEST PROBLEMS PROMPTLY.**



Address inquiries to:  
**24400 PLYMOUTH RD.  
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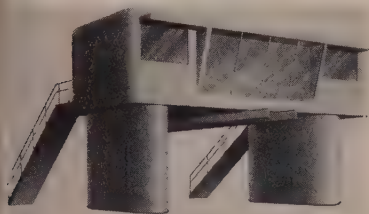
SIZE AND THICKNESS CHART					
TUBE DIAMETER	MAXIMUM WALL				
	DECIMAL		S. W. GAUGE		
	DECIMAL	S. W. GAUGE	DECIMAL	S. W. GAUGE	
3/8"	.375	21	.025	23	
1/2"	.500	20	.025	23	
5/8"	.625	18	.025	22	
3/4"	.750	18	.025	22	
7/8"	.875	16	.025	22	
1"	1.000	14	.025	22	
1 1/8"	1.125	14	.025	22	
1 1/4"	1.250	14	.025	22	
1 3/8"	1.375	14	.025	22	
1 1/2"	1.500	13	.025	22	
1 5/8"	1.625	13	.025	22	
1 3/4"	1.750	13	.025	22	
1 7/8"	1.875	13	.025	22	
2"	2.000	13	.025	22	
2 1/4"	2.125	13	.025	22	
2 1/2"	2.250	13	.025	22	
2 3/4"	2.375	13	.025	22	
3"	2.500	13	.025	22	

\*Intermediate sizes within the range indicated can also be manufactured. Please consult us for sizes not listed.  
Available in all grades of chrome nickel steels, such as types 302, 304, 316 and 347

# New Products and Equipment

## Steel Mill Pulpits

Of standard, insulated, panel-type designs and streamlined throughout, the mill pulpits being fabricated and installed by Lee Wilson Construction Co., Cleveland, O., are for installation wherever one-point control is required, such as in rolling mills, blast furnaces, etc. Walls consist of heavy



steel panels insulated to resist heat. Columns are shrouded, with all wiring concealed yet readily accessible through doors and other openings. Windows at the front are pitched for best possible operating view and thick, shock-resisting glass is used for operator protection.

Other features include acoustical ceilings, nonslip floors, indirect lighting and a toilet. Air conditioning unit is provided to keep temperature at 80° F and free from gases and fumes. Pulpits are supplied in several standard sizes and special sizes to order. Prefabricated, they are shipped in sections.

Check No. 1 on Reply Card for more Details

## Multiple Punch

Design for multiple punching the flanges of long, wide sheets and allowing for punch tools to be mounted on varying centers across the ram face is the horizontal multiple



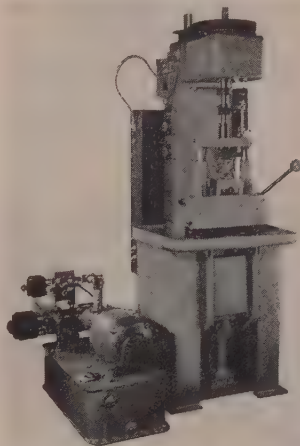
punch, made by Beatty Machine & Mfg. Co., Hammond, Ind. Machine is fitted with an air clamp device which holds the material down during the punching operation for gaging purposes. Stripping is accomplished by air cylinders which travel with the ram. Frames are of welded steel plate.

Clutches are of the jaw type with motor drive V-belt to flywheel. Machine is available in capacities from 50 to 300 tons. The 200 ton machine illustrated has a distance between housings of 63 inches, a stroke of 6 inches, depth of throat of 5 inches and makes 28 strokes per minute. Die space with ram back is 18 1/4 inches. Vertical ram width is 10 1/4 inches and ram length left to right is 72 inches.

Check No. 2 on Reply Card for more Details

## Honing Machine

Hydraulically operated and electrically controlled, the model B7 vertical honing machine, manufactured by Staple Engineering Co., Birmingham, Mich., is adaptable to work having inside diameters ranging from 1/2 to



4 inches inclusive and up to 6 inches in length. Timing cycle is adjustable from 3 to 180 seconds, with standard equipment. Size control is manual by a graduated dial. The reciprocating work table measures 6 x 18 inches and has 8 inches of travel.

A variable speed drive is provided to the honing spindle and is adjustable for ideal honing speeds. Honing stones are fed out and contracted automatically and the pressure and rate of feed are adjustable.

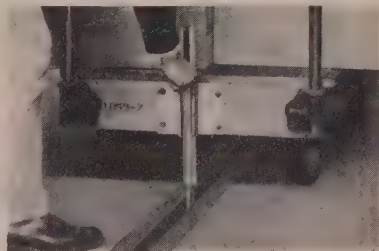
Check No. 3 on Reply Card for more Details

## Chain Conveyor

A continuous chain conveyor with the chain running in a steel slot below the floor is a development of Jervis B. Webb Co., 8951 Alpine Ave., Detroit 4, Mich. A towing pin device is bolted to the end of the standard 4-wheel truck or trailer. Standard 2-wheel trucks may be used

with a dolly. Trucks are set in motion by dropping a pin into the slot. One of the pusher dogs spaced at suitable intervals on the Towveyor chain engages the pin and moves the truck along the route.

Disengaging is by lifting the pin. Then the truck may be pushed away from the slot and handled as any

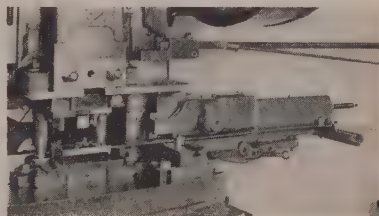


hand push truck. In practice, the Towveyor chain is looped around the warehouse or any area to be served. No preset stations are needed. Strength and construction are such that loads may be towed up or down hill if desirable. No part of the conveyor projects above the floor. Drop forged chain has an ultimate strength of 48,000 pounds. Ball bearing wheels on the chain permit speeds as high as 100 fpm.

Check No. 4 on Reply Card for more Details

## Die Feed

Dies may be fed in any desired direction in punch presses with the Rol-Di-Feed automatic punch press feed built by H. E. Dickerman Mfg. Co., 321 Albany St., Springfield, Mass. Feed may be easily and quickly installed on the press bolster and in some cases, directly on the die shoe. Being of open side design, it will feed



strip materials in almost unlimited range of width and in continuous coils or short lengths. Inasmuch as it feeds throughout most of the 360 degrees of press shaft rotation, it is well suited for feeding of deep drawing or forming dies where a large part of the press stroke is used for drawing or forming.

Feed mechanism will handle coiled or short strip up to 3/16-inch thick



and any width developed for a given thickness of stock where weight of stock does not exceed 2 pounds for linear foot.

Check No. 5 on Reply Card for more Details

## Burnishing Barrels

Improved No. 1 and 2 Mercil burnishing barrel units, made by Hanson-Van Winkle-Munning Co., Matawan, N. J., are being supplied with reducer type direct-connected drive with motor. Alignment is improved and distribution of weight over the

entire barrel is attained by three roller bearings in a supporting ring placed under the forward end of the barrel. The internal gear is fastened to the bottom of the barrel from the outside making unnecessary removal of wood lining blocks when gear or shaft change is necessary.

A petcock is supplied with the cover which can be opened to allow gas to escape. To form a stronger unit, base casting is larger and main shaft has been increased in size. Each barrel is one integral piece without drilled holes and all chances of leak-

age are eliminated. Trunnion brackets have been placed nearer the center of gravity, improving the loaded balance which permits greater ease in handling. Totally enclosed ball bearing type motors are used. Burnishing barrel equipment with vulcanized rubber lining can be furnished.

Check No. 6 on Reply Card for more Details

## Magnetic Starters

Solenoid-operated starters intended for use in general and special purpose applications where across-the-line, nonreversing starting of poly-phase squirrel cage induction motors and single phase motors is permissible are a development of Ward Leonard Electric Co., Mt. Vernon, N. Y. These bulletin 4113 size 3 alternating current starters are of-

## DE-STA-CO *Versatility* WORKS FOR YOU!

The three parts illustrated are typical of the versatile performance we get from just one of our presses. By taking every advantage of modern, high-production equipment, large bed area, progressive tooling and every mechanical aid, we save for you—our customer. That's why buyers across the nation say: "For medium-large jobs and smaller, Detroit Stamping's our Number One source."

Analyze your component stampings. Probably there are several that could be handled better the De-Sta-Co way. You'll find it profitable and pleasant to join our distinguished clientele, customers who have helped us build a reputation for

- Reliability, resulting from 35 years of well-kept promises
- Helpful experience and tool-engineering "know-how"
- Broad production scope from first-class equipment
- Devotion to service and quality

**Automatic Transmission Oil Pan.** Formerly tied up two presses; now confined in one press with two dies, cutoff and draw and redraw. Result . . . saving on press labor, saving on handling.

**Washing Machine Water Intake Manifold.** Originally used four presses. By use of four individual dies in one large press, savings of 25% on press labor, 30% on handling were obtained.

**Roof Rail for Semi-Trailer.** Stock sheared to 56" length before-hand. Blank is formed and bent in one stroke. This operation utilizes the large bed area (48" x 72") and long stroke (10").

Our new booklet, "Stampings", describes our plant, over 75 presses—also other equipment, and the range of our production. Please write for your copy and the name of our Stampings Sales Representative in your area.

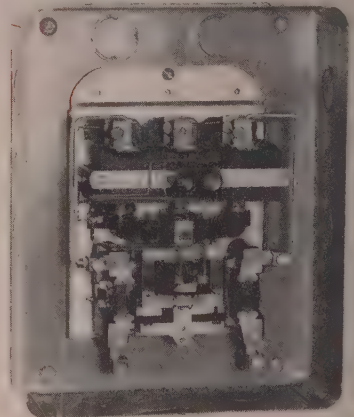


## DETROIT STAMPING COMPANY

359 Midland Avenue

Detroit 3, Michigan

Manufacturers of famous De-Sta-Co Toggle Clamps, Arbor Spacers, Shims, Shim Stock, Blower Housings, Refrigerator Compressor Valves.



fered with open-type construction with built in or specialized control or with NEMA type I general purpose enclosures.

Starters can be controlled by separate pilot devices or can be supplied with local control pushbuttons or selector switches. Features include high arc interruption capacity, thermal overload protection, built-in solderless connectors and double break silver-to-silver main contacts. Units of various ratings are offered. Check No. 7 on Reply Card for more Details

## Lightweight Fork Truck

Because of its lightness, low collapsed height and ability to maneuver in cramped quarters, the model FF Skylift fork truck, designed by Automatic Transportation Co., 149 West 87th St., Chicago, Ill., can overcome physical problems in factories constructed without consideration for possibilities of handling developments requiring heavy equipment. The unit, made in 1000 and 1500-pound capaci-

ty models, handles loads without waste of truck capacity. The smaller model, designed for a 30-inch load, weighs only 2360 pounds and when rated for a 48-inch load weighs 2623 pounds.

Both models lift to 134 inches, with free lift of 68 inches before the telescopic mechanism is extended. Each



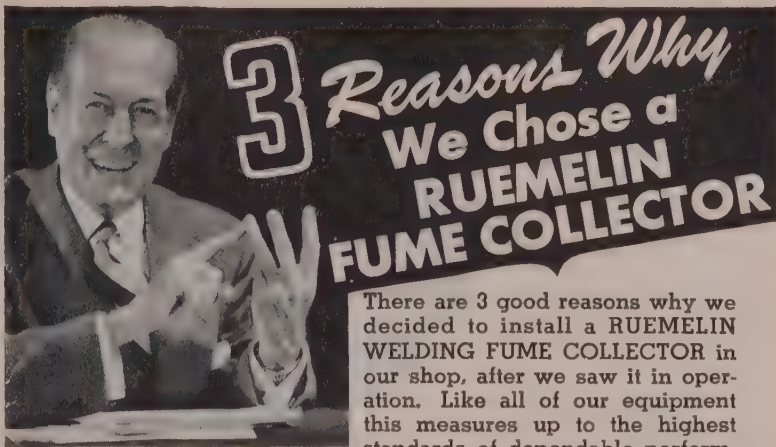
measures 51-1/4 inches from face of forks to the rear. With a 30-inch load the trucks can stack at right angles in an aisle narrower than 8 feet. It has a permanent 2-1/2 degree tilt at the centering point, retracting the load over the wheels. Power is supplied by two standard Transporter batteries, allowing for interchangeability between units made by the company.

Check No. 8 on Reply Card for more Details

## Screw Thread Checker

Lead for the whole length of engagement of the screw, pitch diameter, thread angle, crest, root and taper are compared simultaneously with the thread of a master gage on optical comparators made by Jones & Lamson Machine Co., Springfield, Vt. Also the enlarged shadow instantly reveals wear of tool, chasers, rolling dies or grinding wheel. It not only detects each individual error, but also shows their cumulative effect. The universal stage will measure a wide range of diameters and pitches as well as right or left hand threads.

A pair of rolls, corresponding to the pitch of the thread to be inspected is mounted on the roll shaft. Master gage is then staged on the rolls. The enlarged shadow of the master thread is then made to coincide with the correct tolerance outline on the chart, thus representing a perfect screw in a perfect nut. The master gage is then replaced by the produc-



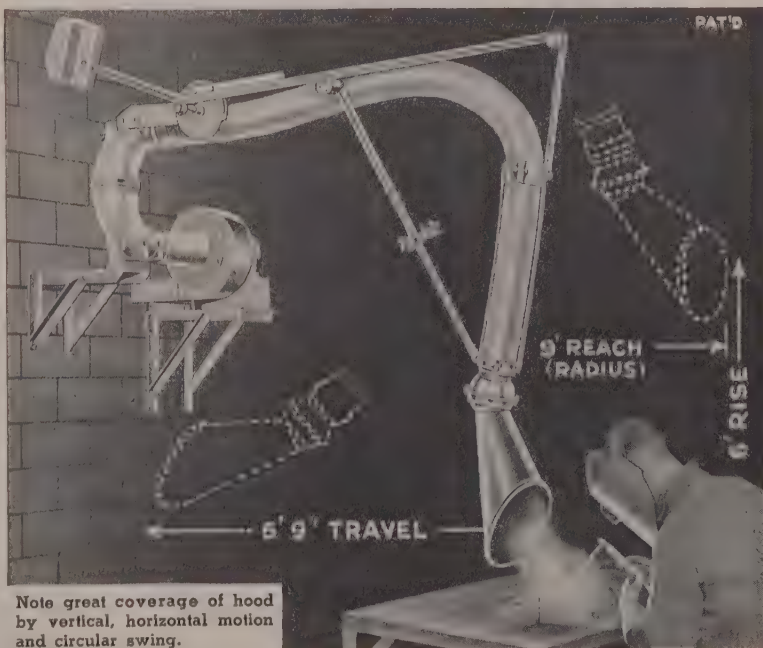
There are 3 good reasons why we decided to install a RUEMELIN WELDING FUME COLLECTOR in our shop, after we saw it in operation. Like all of our equipment this measures up to the highest standards of dependable performance

and maximum health protection because it is:

**1. MORE EFFECTIVE** — The powerful suction of the RUEMELIN FUME COLLECTOR efficiently draws out noxious gas, smoke and heat at the source. It provides great coverage, minimizes building heat loss, reduces welder's fatigue and guards employee's health — all to increase shop efficiency and output.

**2. COMPLETELY FLEXIBLE** — It is easily installed with least expense. When in operation, its hood instantly and conveniently adjusts for greater proximity to welding area without tedious adjusting devices.

**3. UNIVERSALLY APPROVED** — The RUEMELIN FUME COLLECTOR has the approval of state industrial commissions and compensation insurance companies. In addition it has the support of the thousands of users who have found their Ruemelin installations so satisfactory on the job.



Standard Model D-5310 with hood reaching out 9 feet from wall. Also available in Long Reach Model D-5342 with hood reaching out 15 feet from wall.

For complete details write for Bulletin 37-C

## RUEMELIN MFG. CO.

MANUFACTURERS AND ENGINEERS

SAND BLAST AND DUST COLLECTING EQUIPMENT

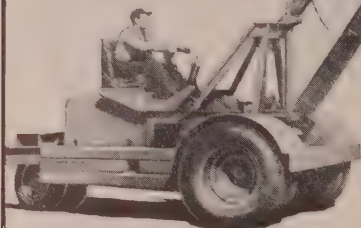
3882 NORTH PALMER STREET

MILWAUKEE 12, WISCONSIN, U. S. A.



**KRANE KAR** Loads and Unloads freight cars, trucks, trailers; Stores materials; expedites Plant Maintenance. Often cuts cost of handling loads to 8¢ a ton.

No Mobile Crane made today can match **KRANE KAR** speed, safety, and economy of operation... picking up, carrying, and placing loads... anywhere, in plant or yard... uneven terrain, congested areas, low overhead, up and down ramps.



**KRANE KAR** handles loads at Sides as well as at Front.

**KRANE KAR**  
MOVES LOADS  
EASIER - FASTER -  
SLASHES COST OF  
MATERIALS HANDLING

Gas or Diesel. Pneumatic or solid rubber tires; 9 to 37 ft. booms or adjustable telescopic booms; Electric magnet, clamshell bucket, and other accessories available. Ask for illustrated Bulletin No. 79.

**USERS:** General Motors, Bethlehem Steel, Boeing, Pullman-Standard, Lima Locomotive, Carnegie-Illinois, U. S. Steel, Basic Magnesium, etc.

THE ORIGINAL SWING-BOOM MOBILE CRANE  
WITH FRONT-WHEEL DRIVE AND REAR-WHEEL STEER  
1½, 2½, 5, AND 10 TON CAPACITIES

**KRANE KAR**  
TRADE MARK REGISTERED

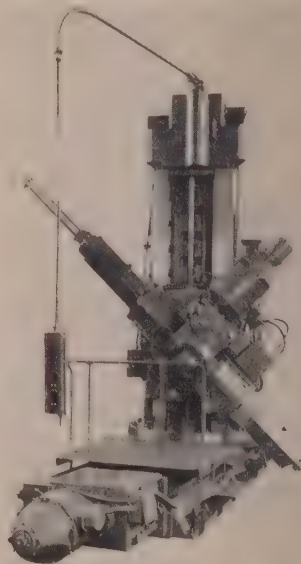
**SILENT HOIST & CRANE CO., 849 63rd ST., BKLYN 20, N.Y.**

tion screw to be inspected. Its shadow must fall between the maximum and minimum tolerance outlines on the comparator chart.

Check No. 9 on Reply Card for more Details

### Travel Head Planer

Arranged for shaping, planing and slotting only, the universal traveling head planer, offered by Morton Mfg. Co., Broadway and Hoyt, Muskegon Heights, Mich., has a column which will rotate 360 degrees and a ram adjustable 25 degrees, either way from the horizontal position. The machine has 65 inches of extreme length of cutting stroke with 48 inches of



vertical feed on the column and a bed approximately 17 feet long providing 10 feet of horizontal travel.

A 9-inch square forged steel ram provides extreme rigidity in heavy duty operations. The standard draw-cut shaper head has 6 inches of hand feed and uses 1½ x 2 inch cutting tools. Alternating current variable voltage motors and control equipment are provided. It can be equipped with jib crane with either manual or electric hoist. Push cut and pull cut slotter bars for working in small openings may be provided.

Check No. 10 on Reply Card for more Details

### Metal Parts Analyzer

Operating on the core loss principle for rapid and nondestructive metallurgical examination and sorting of metal parts, the model C Cyclograph, was developed by J. W. Dice & Co., 191 River Rd., Grand View-on-Hudson, N. Y. The wide range of test frequencies available in

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for heavy and light vehicles



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MADE  
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**F**AIRFIELD is a specialist in producing differentials for all kinds of vehicles. By using Fairfield service, manufacturers get these important benefits:

**A BETTER PRODUCT.** Finest production facilities, advanced engineering practice, and a highly trained organization of skilled craftsmen stand back of the Fairfield reputation for producing fine gears and differentials!

**MASS PRODUCTION ECONOMY.** Thanks to large volume of work handled in the Fairfield factory.

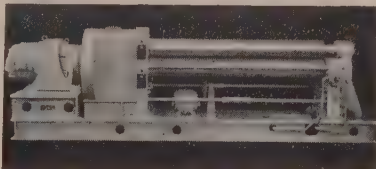
**A DEPENDABLE SOURCE OF SUPPLY.** Serving hundreds of large and small users of gears and differentials. Get acquainted with Fairfield's facilities. Your inquiry will receive prompt attention.

the portable instrument makes possible a variety of nondestructive tests. Range is from 2 to 200 kilocycles.

Instrument is particularly applicable to the checking or sorting of metal parts on the basis of analysis, structure, hardness case depth, and in some cases, stress concentration. Concerning the latter use, it can be employed to trace internal stress changes, compare stresses at different levels, or measure stress in pounds per square inch by calculation. Test coil may be placed up to 12 feet from the instrument. Operation is on 115 volts, 40 to 60 cycle current.

Check No. 11 on Reply Card for more Details

alternating current gearhead or variable speed slip-ring type with separate gearhead. Rear bearing on the top roll is available either with



manual operation or automatic air cylinder operation. Sizes and lengths are manufactured to requirements.

Check No. 12 on Reply Card for more Details

function of speed, operates a relay so as to open up a standard reversing contactor as used by all mechanically driven plugging switches.

Controller is small in size and easy to install. It is designed for panel mounting. Adjustment to any desired drop-out speed is made by adjusting the potentiometer. It is suitable for use with standard dual-voltage induction motors and with standard two-speed motors and can be used with operations requiring inching or jogging.

Check No. 13 on Reply Card for more Details

## Metal Roll

Pipe, well casing and general metal rolling may be produced on the new metal roll being manufactured by Valley Foundry & Machine Works Inc., Fresno, Calif. A heavy duty machine of the three roll initial type, it is capable of rolling heavy gage and alloy steels. Design is for constant-use high production.

Frame of the machine is of steel and rolls are forged 4140 alloy steel. Gears are heat-treated and hardened. Unit has a specially wound stator motor and which is a 3-phase,

## Plug Controller

Requiring no mechanical connection to the motor, the all-electric plug controller, manufactured by Standard Control Division, Standard Dayton Corp., Dayton 1, O., is a self-contained device for braking or plugging induction motor driven machines accurately to a stop. Its operation is based on the fact that as the rotor bars pass the stator teeth of an induction motor a high frequency ripple is introduced into the stator winding. This frequency, a direct

## Flame Failure Safeguard

Protection against the hazard of explosion caused by flame failure in industrial oil-burner installations is provided by Combustion Control Corp., 77 Broadway, Cambridge 42, Mass., through a system of supervising both the pilot gas and main oil flames of fully automatic burners. If the electronic flame rod "feels" that pilot flame has not come on or is unsuitable for ignition, it signals this condition to the programming control and the burner shuts down before the main oil valve opens.

With proper ignition, the main oil valve opens. The oil flame is then

## RESPONSIBILITY OF OPERATORS FIXED

The F. G. Schenuit Rubber Company of Baltimore, Md. sells very few of their products under their own brand name. However, their large output for merchandising firms, under various names has put this company in the front rank of quality tire producers. Much of Schenuit's production is also channeled into industrial and airplane tires where high standards of endurance are required.

## New and best methods

Like any other contract manufacturer, Schenuit must develop high efficiency and quality production. Shown here is operator George D. Shearer affixing his Topflight Tape number to the tire carcass he has worked on. Pressure-sensitive tape, applied in an instant, identifies his work. Because he knows his number holds him responsible, he takes greater pride and greater care.

## TOPFLIGHT TAPE COMPANY

ERWIN HUBER, President

YORK

PENNA.





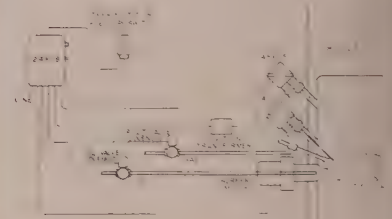
• Ruggedly made to withstand severe use . . . advanced designing in fan blades . . . rigidly mounted and securely locked in place . . . well balanced and readily portable by overhead crane or auxiliary truck. Stationary and oscillating types with either pedestal (floor mounting) or bracket (wall mounting).

**B. F. Perkins & Son, Inc.**  
HOLYOKE, MASSACHUSETTS  
*Manufacturers of Industrial Machinery Since 1873*

# PERKINS MAN COOLERS

TRADE MARK REGISTERED UNITED STATES PATENT OFFICE

monitored by a photoelectric scanner, which contains both the phototube and amplifier tube and is designed to withstand conditions of relatively high ambient temperature. It is impervious to ambient humidity. The programming control is designed to



provide accurate setting of both oil valve delay and post ignition periods in seconds upon installation. Timing is accomplished through a synchronous motor. Relay contacts are capable of handling directly a pump motor of 1 hp rating.

(Check No. 14 on Reply Card for more Details)

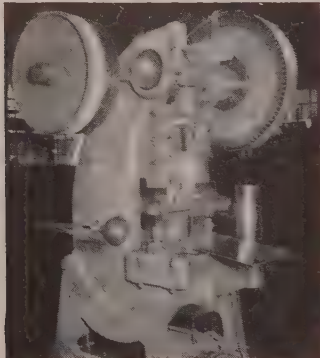
## Magnetic Drum

Powered by Alnico magnets, a completely self-energized magnetic drum, announced by Eriez Mfg Co., Erie, Pa., is adaptable for the automatic removal of tramp iron and fine ferrous contamination where ma-

*Whatever the job*

**IF IT CALLS FOR  
A PUNCH PRESS**

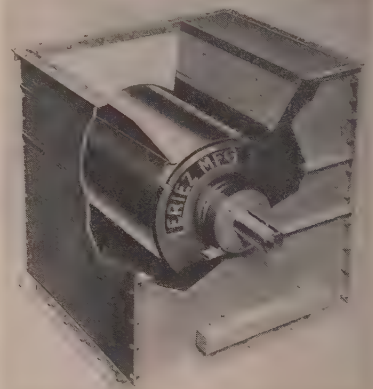
**AN L & J PRESS  
CAN DO IT FOR LESS COST!**



BLANKING, forming, piercing, drawing, trimming — L & J presses have the stamina and soundly engineered design to provide top output at bottom cost.

In the multiple hole punching operation shown, a manufacturer is keeping production costs to a minimum. In use many years NO repairs whatsoever have been necessary on this L & J Press. And so it goes — cost sheets of users of L & J Presses for all types of operations tell a similar story.

Send for Catalog L-7—see how they're built and you'll see why we say "An L & J can do it perfectly at less cost."



terials are conveyed in spouts, chutes and other similar conveying systems not employing belts. Drum separators consist of a revolving cylindrical shell within which a stationary high-powered permanent magnet is located. The magnet covers about half the cross sectional area of the drum.

Material is fed onto the drum shell, nonmagnetic material being discharged first and separately, while the magnetically susceptible portion is held against the shell until it passes out of the magnetic field. Unit is offered in 18 different sizes including

# L & J PRESS

C O R P O R A T I O N

Successors to Loshbough-Jordan Tool & Machine Co. Established 1911

828 REN ST., ELKHART, INDIANA

PRE-PAINT RECOMMENDATION:

1st Stage - Spray 3  
OAKITE CRYSCOAT

2nd Stage - Rinse

3rd Stage - Rinse

## To prepare steel for painting

FOR low cost... for fast, thorough cleaning... for strong grip of paint on steel... for smooth, lustrous final paint coat... there is nothing to equal the OAKITE CryCoat PROCESS.

**FREE** Write today to Oakite Products, Inc., 34E Thames St., New York 6, N. Y., for more information on the OAKITE CryCoat PROCESS or Oakite methods for:

- Precleaning in tanks or machines
- Alkaline cleaning in tanks or machines
- Pickling
- Barrel cleaning
- Electrocleaning
- Steam-gun cleaning
- Paint stripping
- Rust prevention

### OAKITE



SPECIALIZED INDUSTRIAL CLEANING  
MATERIALS • METHODS • SERVICE

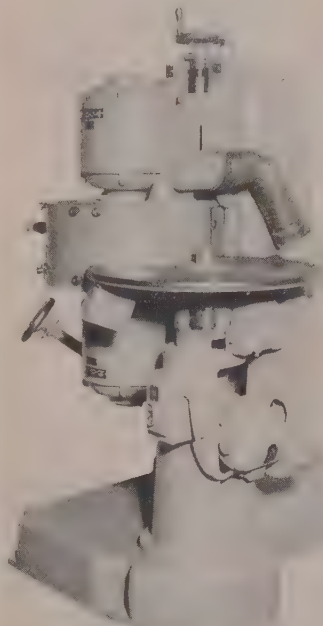
Technical Service Representatives Located in  
Principal Cities of United States and Canada

12, 18 and 24-inch diameters and in drum widths up to 50 inches. The drum may be ordered as a separate unit or complete with housing.

Check No. 15 on Reply Card for more Details

### Vertical Grinder

Grinding wet or dry as fast as it can be loaded, the double vertical spindle grinder, designed by Charles H. Besly & Co., 118 N. Clinton St., Chicago 6, Ill. has an output of 2400 pieces per hour when manually loaded by skilled operator. With a hopper feed attachment it can produce



5000 or more pieces per hour, depending upon the area of the pieces to be ground.

Listed as No. 905, the grinder features quick convertibility from one job to another by easy replacement of the feed wheel. It is adaptable to a wide range or type of production grinding. Machine has two 3 hp motors of 1750 rpm on grinding heads, and offers a choice of 15, 16 or 18-inch diameter abrasive disks.

Check No. 16 on Reply Card for more Details

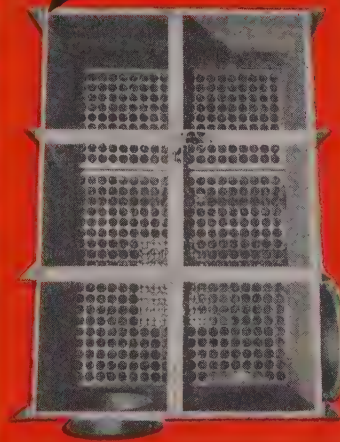
### Pump Motor

An interchangeable base which permits increase or decrease in horsepower without the expense of remachining or exchanging the pump head is a designed feature of the Verticlosed Streamway motor, a development in deep well vertical pump motors announced by U. S. Electrical Motors Inc., 200 E. Slauson Ave., Los Angeles 54, Calif. A waterproof

## STRUCTURAL STEEL FABRICATION



## SPECIAL FABRICATION



We are prepared to furnish any type of fabrication in any metal to your particular specifications. Write...

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**LEVINSON**  
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## Cuts Handling Costs IN HALF! Works All Day for 11¢\*

Imagine, if you can, a brawny electric truck that moves and lifts 6000 pounds of your product so simply and easily, even your stenographer could operate it all day, and never become the *slightest bit fatigued!*

That miracle truck is Automatic Transporter. It moves and lifts *any and every* kind of product with amazing touch-of-thumb ease. All operator does is *press the button*. *Transporter does the rest!* One man handles more material than three men *manually*... enjoys doing it!

No wonder Transporter astounded management with its new, low-cost way to cut handling costs thousands of dollars. And it does it for as little as \*11¢-a-day battery charging cost, maintenance and replacement no item at all. Industry-tested and proved, thousands and thousands are in daily operation. Mail coupon for FREE CATALOG of money-saving facts.

### MAIL COUPON TODAY!

**AUTOMATIC TRANSPORTATION CO.**  
DIV. OF THE YALE & TOWNE MFG. CO.

77 W. 87th Street, Dept. C-1  
Chicago 20, Ill.

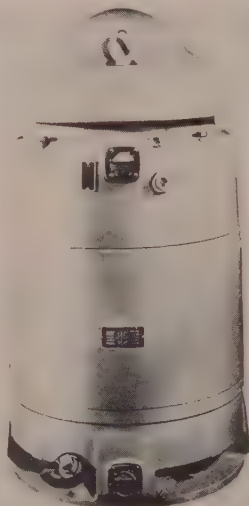
Send free catalog showing Transporter new, low-cost way to cut handling costs in half.

Name.....

Address.....

housing protects vital parts of the motor from injurious weather conditions and downdraft ventilation prevents re-entry of expelled hot air.

Flush oil gages are made with Lucite windows, giving full visibility of oil supply. The Lubriflush lubrication system permits thorough flushing out of all devitalized grease by



forcing clean grease through each bearing. An adjustable hollow shaft makes possible precise adjustment of impellers of a deep well turbine pump. Standard type models include a reverse protection clutch and a special nonreversing locking device can be provided if desired.

Check No. 17 on Reply Card for more Details

### Strapping Kit

Carried like a small briefcase is the strapping kit which contains a Steelbinder strapping tool and cutter and enough coil strapping and seals



to handle several jobs without a re-fill, made by A. J. Gerrard & Co., 221 N. La Salle St., Chicago, 1, Ill. The strapping is unreel through a small slit in one end of the steel case.

Use of the kit eliminates wasteful estimates on the amount of strapping needed for particular jobs by dis-

## SMALL STAMPINGS

**Any Metal  
Any Quantity**

30 years' experience  
gives us the  
"know how"

Hundreds of satisfied  
customers are evidence  
of our high quality

THE  
**MASTER PRODUCTS**

COMPANY

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pensing at the point of use exactly the length of strap required. For special climatic or chemical conditions which must be considered, the strapping and seals can be supplied in such metals as galvanized, Monel, stainless steel, copperclad, and aluminum. The kit measures 5 x 12 x 14 inches.

Check No. 18 on Reply Card for more Details

### Portable Disintegrator

Broken tools, studs and pins may be removed with the low-cost, lightweight, portable disintegrator, announced by Elox Corp., Clawson, Mich. The model X machine will re-



move these parts in sizes from 0.085-inch upward. Small enough to be set on a shelf, it can be carried in one hand and set into the chuck of a drill press.

To use it is necessary only to supply a source of city water and electricity at lighting voltage. The machine will use about 2 gallons of water per hour. Working voltage at the point of contact is about the same as that of a flashlight. Time taken to remove a broken tool depends upon such variables as size, depth, through or blind hole, kind of metal, etc. A self-feeding feature allows one operator to use several machines at one time. There is no distortion, electrolysis or mutilation of any kind.

Check No. 19 on Reply Card for more Details

### Quick Change Lathes

South Bend Lathe Works, 390 East Madison St., South Bend 22, Ind., is making a series of 13-inch swing tool and quick change gear lathes, featuring new tailstock base with improved bed way wiper system and one-

Wyandotte

makes the

complete line of

# BALANCED METAL CLEANERS

- Cleaners for any soak, electrolytic, spray or tumble operation.
- Degreasing compounds and specialty products including burnishing compounds, paint strippers and burring compounds.
- Wyandotte Zorball, the all-purpose floor absorbent, for reducing fire and slipping hazards.
- For complete information, just call your nearest Wyandotte Representative. He's always at your service.

WYANDOTTE CHEMICALS CORPORATION • Wyandotte, Michigan

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## BEDFORD CRANES



Since 1903

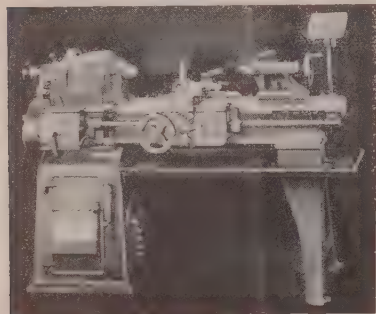
There is no comparison between our first crane and the sleek, rugged, safe and dependable model we produce today. The very fact, however, that we have been in business for nearly half a century suggests that industry has made a habit of specifying BEDFORD CRANES. With capacities from 5 to 150 tons, any span or lift, they are designed and engineered to meet specific requirements. OVERHEAD TRAVELING CRANES • GANTRY CRANES • STEEL DERRICKS • STRUCTURAL STEEL • STEEL BUILDINGS • GRAY IRON CASTINGS.

**BEDFORD FOUNDRY & MACHINE CO.**  
BEDFORD, INDIANA, U. S. A.  
Engineers • Designers • Fabricators



point oiling system for reverse lever bracket and twin gear bearings. Headstock spindle has a 1½ inch bore and will take No. 5 South Bend collets which have a maximum capacity of 1 inch. This increased spindle capacity permits machining 1½ inch bar stock fed through the spindle and a suitable chuck. Bar stock up to 1 inch may be fed through the spindle and No. 5 draw-in collet assembly.

Lathes are equipped with quick change gear box and double wall



apron. The underneath motor is entirely self-contained. Spindle speeds from 34 to 875 revolutions per minute may be selected. Bed lengths are 4, 5, 6 or 7 feet. The No. 5 South Bend collets used are available in 61 fractional capacities down to 1/16 inch for round stock. Other sizes and square or hexagon No. 5 collets can be supplied on order.

Check No. 20 on Reply Card for more Details

\* \* \*

**TRACER:** Physicists Research Co., Ann Arbor, Mich., offers type GB tracer that provides for measuring on internal grooves and slots; tracing axially in small holes; tracing both transversely and longitudinally in narrow slots and grooves and on gear teeth; and on internal or external tapered surfaces. May be used with all profilometer amplifiers.

Check No. 21 on Reply Card for more Details

**WRAPPER:** For corrosion-proof packaging of steel and iron, Nox-Rust wrappers are available from Nox-Rust Chemical Corp., Chicago 8, Ill. The slow vaporization of a synthetic chemical contained in the wrapper completely surrounds the part with a vapor sheath which in most cases requires no supplementary coating.

Check No. 22 on Reply Card for more Details

**RUST INHIBITOR PAINT:** End-O-Rust is available in type No. 1 for inside use and No. 2 for outside use and can be applied by brush, spray or dip methods. Its capillary attrac-

tion allows material to take firm anchorage to metal and to prevent oxygen, acids, salts and similar material from contacting the metal. It is available from Al-Tex Products Co., Cleveland, O.

Check No. 23 on Reply Card for more Details

#### DIAMOND, CARBIDE SETTER:

With the Qvaliset, made by Diamond Industries Inc., represented by K-E Industries, Minneapolis 7, Minn., the operator can set a diamond or a carbide insert in less than 2 minutes. Operator has absolute control of setting at all times. Machine operates on 110 volts, alternating current.

Check No. 24 on Reply Card for more Details

#### SOCKET SET SCREWS:

Parker-Kalon Corp., New York 14, N. Y., offers No. 225 assortment of set screws which are centerless thread ground and free from nicks, burrs, hardening scale and other imperfections.

Check No. 25 on Reply Card for more Details

#### CARBIDE-TIPPED TOOLS:

Lovejoy Tool Co. Inc., Springfield, Vt., announces a line of carbide-tipped end mills and suitable holders featuring a positive locking device. Two-flute end mills are available in diameters from ½ to 1 inch; four-flute mills from ¾ to 2 inches.

Check No. 26 on Reply Card for more Details

#### ELECTRIC DRILL:

An important feature of No. 112 electric drill is the chuck spindle offset which permits operator to drill in close quarters without removing pipe or spade handles. It is made by Stanley Electric Tools, New Britain, Conn.

Check No. 27 on Reply Card for more Details

#### WATER DEMINERALIZER:

A cartridge-type water demineralizer, designed to convert ordinary tap water to the chemical equivalent of distilled water, is announced by Penfield Mfg. Co. Inc., Meriden, Conn.

Check No. 28 on Reply Card for more Details

#### SWIVEL JOINT:

Seamlex Co. Inc., Long Island City, N. Y., offers an all metal swivel joint suitable for steam, water, oil, air, etc., with a maximum working pressure of 1000 pounds per square inch and a maximum temperature of 600° F.

Check No. 29 on Reply Card for more Details

#### SOCKET PROTECTOR:

Adjusco-Loc socket protector is designed to

cut replacement costs of sockets and wiring, reduce danger of blown fuses, electrical shock and fire caused by twisted wires and broken splices. It is available from Adjustable Fixture Co., Milwaukee 2, Wis., in ¼ or ⅜-inch IP thread as a separate assembly or complete with pull chain, key or push through socket.

Check No. 30 on Reply Card for more Details

#### BLOWERS:

Air and Hydraulic Division, Lindberg Engineering Co., Chicago 12, Ill., announces Lindberg-Fisher single stage, centrifugal blowers. They feature full 360 degree positioning of air outlet.

Check No. 31 on Reply Card for more Details

#### CLAMP:

A steel plate clamp for handling all plates of ¼ to 2-inches has been developed by Marbott Weld Co., Cleveland, O. Designated as the Marbo-Clamp, it measures 9 inches wide and 12 inches high.

Check No. 32 on Reply Card for more Details

#### LAPPING COMPOUNDS:

An oily paste base abrasive compound has been developed by United States Products Co., Pittsburgh 13, Pa., for fine finishing all types of gears. It can be applied with a brush or paddle and will adhere to gear teeth while in work.

Check No. 33 on Reply Card for more Details

#### PRIMER:

An air drying and baking primer for all metals including aluminum alloys, magnesium alloys, Monel, tin, steel, copper and galvanized metals, is offered by Princeton Paint Laboratories, Princeton, N. J. Designated as No. 10, it supplies excellent tooth for subsequent coatings and eliminates pretreating of metals.

Check No. 34 on Reply Card for more Details

#### EXTINGUISHER:

A dry chemical fire extinguisher containing 2 pounds of Plus-Fifty dry chemical has been designed for effective use by inexperienced operators by Ansul Chemical Co., Marinette, Wis.

Check No. 35 on Reply Card for more Details

### FOR MORE INFORMATION

on the new products and equipment in this section, fill in a card. It will receive prompt attention.

**METALWORKING** operations appear to be slowing down further. More plants have gone to a four-day week and additional shutdowns have been reported with industry retreating from postwar production peaks. Deceleration is spreading. Last week Hudson Motor Car Co. cut production to levels more in harmony with current sales. This is the fourth auto builder to cut back, the others being Kaiser-Frazer, Willys and Lincoln.

Slackening industrial activity is being reflected in noticeable contraction in steel requirements, and over the past week or so sentiment in steel market circles has deteriorated significantly with order cancellations and shipment deferments increased. Some talk now is heard of a possible slackening of steelmaking operations before the second quarter is well along.

**OUTLOOK**—Manufacturing operations are on a high plane despite disturbing curtailments. A large volume of unsatisfied demand still is entertained in many directions. Steel consumption continues heavy. However, the outlook is obscured by the uncertainties and contradictions in appraisals of conditions. Government experts still insist inflation threatens; that employment and production will continue above prewar levels in most lines; that the slackening now being experienced is no more than a needed adjustment from abnormal levels. Industrialists, nevertheless, view prospects with increasing concern and there is some evidence their view is catching on in official Washington.

**DEMAND**—Steel mill order volume in the major products, carbon sheets, strip, plates, bars, shapes and pipe is holding in excess of producers' ability to supply promptly. How long this condition will last is debatable, however, with the deceleration in business gaining momentum. Supply-demand balance in special steels and alloys has been in evidence for some time past, and it appears approaching in other

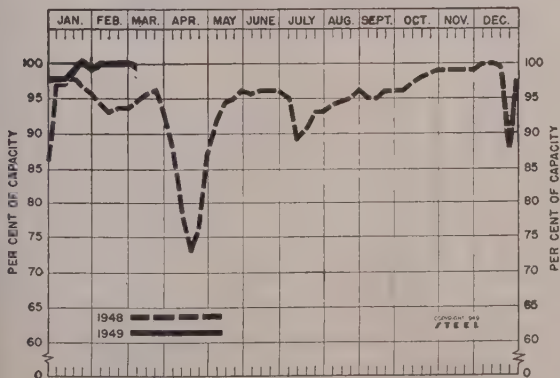
products much more rapidly than had been indicated only ten days ago. Consumers are limiting new buying and are more exacting on adherence to specifications. Gray market offerings are going begging despite sharply reduced prices, conversion deals are drying up, premium prices are fading as competitive conditions assume more normal patterns and some consumers are dumping excess inventories.

**SUPPLY**—Openings are appearing in rolling schedules more frequently, but, except for the premium-priced producers, little difficulty as yet has been encountered in diverting open tonnage to regular customers still on short rations. Premium-priced producers are meeting difficulty filling gaps in schedules and are offering some tonnage on 40-45 days delivery. On the whole, the steel market still presents a fairly strong front though producers' concern is rising with some large consumers, such as the railroad car shops, displaying increasing reluctance to take in all the tonnage allotted them. No all-out scramble for business is in sight, however.

**PRICES**—Except for a reduction of \$10 per ton on cold-rolled sheets by the Granite City Steel Co. last week the market lacks significant price developments. The Granite City reduction brought its price down to a level competitive with tonnage being shipped into its home territory from outside producing points. For the most part it is thought to reflect adjustment of premium-priced tonnage to a realistic basis in the light of increasing competition. The action was in line with similar adjustments over recent weeks in pig iron, wire and silicon sheets by various other producers.

STEEL's arithmetical price composite on steel-making scrap declined for the ninth consecutive week to \$37.33, the lowest level since July, 1947. Scrap continues to move sluggishly with sales so small it is extremely difficult to determine the exact level of the going market.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts				
	Week Ended March 5	Change	Same Week 1948	Same Week 1947
Pittsburgh .....	94.5	— 0.5*	96	93.5
Chicago .....	100	— 1.5*	94	93
Eastern Pa. ....	97	None	91	88
Youngstown .....	105	None	103	90
Wheeling .....	92	— 0.5	90	89
Cleveland .....	99.5	— 1	94	91
Buffalo .....	104	None	88.5	88.5
Birmingham .....	100	None	100	99
New England .....	87	— 1	85	90
Cincinnati .....	106	+ 3	90	91
St. Louis .....	82.5	— 7	77.5	74.5
Detroit .....	103	— 1	90	88
Estimated national rate .....	99.5	— 0.5	94.5	93

Based on weekly steelmaking capacity of 1,843,516 net tons for 1949; 1,802,476 net tons for 1948; 1,749,928 tons for 1947. \*Revised.



## COMPOSITE MARKET AVERAGES

## Arithmetical Price Composites\*

	Mar. 5	Feb. 26	Feb. 1949	Mar. 1948	5 Years Ago
Month Ago					
Year Ago					
5 Years Ago					
Finished Steel	\$97.77	\$97.77	\$97.77	\$81.14	\$56.73
Semifinished Steel	75.75	75.75	75.75	68.72	36.00
Steelmaking Pig Iron	46.22	46.22	46.22	39.34	23.00
Steelmaking Scrap	37.33	37.50	38.48	40.21	19.17

\* **STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide mill prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (re-rolling billets and slabs, sheet bars, skelp, and wire rods, on Basic Pig Iron (at eight leading producing points), and on Steelworks Scrap (No. 1 melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composites, dollars per net ton; pig iron and scrap, gross ton.

† **FINISHED STEEL WEIGHTED COMPOSITE:** Computed in cents per pound, mill prices, weighted by actual monthly shipments of following products, representing about 82 per cent of steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin andterne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. January and February, 1949, figures are preliminary.

FINISHED STEEL  
WEIGHTED COMPOSITE†

Feb. 1949	4.20580c
Jan. 1949	4.20580c
Dec. 1948	4.20208c
Feb. 1948	3.54374c
Feb. 1944	2.38787c

## COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton, others dollars per gross ton. Delivered prices represent lowest from mills.

## Finished Materials

	Mar. 5	Feb.	Dec.	Mar.
1949	1949	1948	1948	
Steel bars, Pittsburgh mills	3.45c	3.45c	3.45c	2.90c
Steel bars, del. Philadelphia	3.8164	3.8164	3.79	3.356
Steel bars, Chicago mills	3.35	3.35	3.35	2.90
Shapes, Pittsburgh mills	3.275	3.275	3.275	2.80
Shapes, Chicago mills	3.25	3.25	3.25	2.80
Shapes, del. Philadelphia	3.4918	3.43	3.48	2.968
Plates, Pittsburgh mills	3.50	3.50	3.50	2.95
Plates, Chicago mills	3.40	3.40	3.40	2.95
Plates, del. Philadelphia	3.7256	3.7256	3.71	3.19
Sheets, hot-rolled, Pittsburgh mills	3.275	3.275	3.275	2.80
Sheets, cold-rolled, Pittsburgh	4.00	4.00	4.00	3.55
Sheets, No. 10 galv., Pittsburgh	4.40	4.40	4.40	3.95
Sheets, hot-rolled, Gary mills	3.25	3.25	3.25	2.80
Sheets, cold-rolled, Gary mills	4.00	4.00	4.00	3.55
Strip, No. 10 galv., Gary mills	4.40	4.40	4.40	3.95
Strip, hot-rolled, Pittsburgh mills	3.275	3.275	3.275	3.05
Strip, cold-rolled, Pittsburgh mills	4.375	4.375	4.375	3.80
Bright basic, wire, Pittsburgh	4.325	4.325	4.325	3.775
Wire nails, Pittsburgh mills	5.775	5.775	5.775	5.20
Tin plate, per base box, Pitts. dist.	\$7.75†	\$7.75†	\$6.80	\$6.80

## Pig Iron

	Mar. 5	Feb.	Dec.	Mar.
1949	1949	1948	1948	
Bessemer, del. Pittsburgh (N.&S. sides)	\$48.08	\$48.08	\$48.08	\$40.99a
Basic, Valley	46.00	46.00	46.00	39.00
Basic, eastern del. Philadelphia	50.3002	50.3002	50.17	42.004
No. 2 fdry., del. Pgh. (N.&S. sides)	47.58	47.58	47.58	40.496
No. 2 fdry., del. Philadelphia	50.8002	50.8002	50.87	42.504
No. 2 foundry, Chicago	46.25	46.25	46.25	39.00
No. 2 foundry, Valley	46.50	46.50	46.50	39.50
Southern No. 2 Birmingham	43.38	43.38	43.38	37.88
Southern No. 2 del. Cincinnati	49.43	49.43	49.09	41.857
Malleable, Valley	46.50	46.50	46.50	39.50
Malleable, Chicago	46.50	46.50	46.50	39.50
Charcoal, low phos., fob Lyles, Tenn.	66.00	66.00	66.00	55.00
Ferromanganese, f.o.b. Etna, Pa.	163.00	163.00	163.00	151.00*

\* F.o.b. cars Pittsburgh.

## Scrap

Heavy melt. steel, No. 1, Pittsburgh	\$39.00	\$40.00	\$42.75	\$40.25
Heavy melt. steel, No. 2, E. Pa. .	34.25	35.69	41.50	39.00
Heavy melt. steel, No. 1, Chicago	34.00	35.75	41.75	38.875
Heavy melt. steel, No. 1, Valley	37.75	37.75	42.75	40.25
Heavy melt. steel, No. 1, Cleveland	36.50	37.25	42.25	39.75
Heavy melt. steel, No. 1, Buffalo	39.50	40.50	46.50	44.00
Rails for re-rolling, Chicago	45.75	48.19	70.38	49.625
No. 1 cast, Chicago	41.50	44.25	70.50	66.00

## Coke

Connellsville, beehive furnace	\$14.50	\$14.50	\$14.50	\$12.50
Connellsville, beehive foundry	17.00	17.00	17.00	14.875
Chicago, oven foundry, ovens	20.40	20.40	20.40	19.25

## Semifinished

Sheet bars, mill	\$67.00*	\$67.00*	\$67.00*	\$60.00
Slabs, Chicago	52.00	52.00	52.00	45.00
Re-rolling billets, Pittsburgh	59.00	59.00	59.00	45.00
Wire rod $\frac{3}{8}$ to $\frac{1}{2}$ -inch, Pitts. dist.	3.775c	3.775c	3.775c	3.175c

\* Nominal. † 1.50 lb coating.

## FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants.

## Semifinished Steel

**Carbon Steel Ingots:** Re-rolling quality, standard analysis, open market, \$100-\$105 per gross ton. Forging quality, \$50 per net ton, mill.

**Alloy Steel Ingots:** \$51 per net ton, mill.

**Re-rolling Billets, Blooms, Slabs:** \$52 per net ton, mill, except: \$62, Conshohocken, Pa.; \$66, Monessen, Pa.; sales by smaller interests on negotiated basis at \$85 per gross ton, or higher.

**Forging Quality Billets, Blooms, Slabs:** \$61 per net ton, mill, except: \$68, Conshohocken, Pa., mill.

**Alloy Billets, Slabs, Blooms:** Re-rolling quality, \$63 per net ton, mill except: \$70, Conshohocken, Pa.

**Sheet Bars:** \$67 nom., per net ton, mill; sales in open market \$110-\$115 per gross ton.

**Skelp:** 3.25c per lb, mill.

**Tube Rounds:** \$76 per net ton, mill; some sellers quoting up to \$120 per gross ton.

**Wire Rods:** Basic and acid open-hearth, 7/32 &  $\frac{1}{2}$ -inch, inclusive, 3.40c per lb, mill, except: 3.65c, Struthers, O.; 3.70c, Worcester, Mass.; 4.05c, Pittsburgh, Calif.; 4.10c, Portsmouth, O.; Los Angeles; 4.15c Monessen, Pa. Basic open-hearth and Bessemer, not re-sulphurized, 7/32 to 47/64-inch, inclusive, 3.50c, mill.

## Bars

**Hot-Rolled Carbon Bars (O.H. only; base 20 tons):** 3.35c, mill, except: 3.55c, Ecorse, Mich.; Pittsburgh, Monessen, Alliquippa, Pa.; 4.05c, Pittsburgh, Torrance, Calif.; 4.10c, S. San Francisco, Los Angeles, Niles, Calif.; Portland, Ore.; Seattle; 4.20c, Kansas City, Mo.; 4.25c, Minnequa, Colo.; 4.40c, Atlanta; 5.30c, Fontana, Calif.

**Rail Steel Bars:** (Base 10 tons): 3.35c, Moline, Ill.; 5.10c, Williamsport, Pa.; another interest quotes 5.35c, mill.

**Hot-Rolled Alloy Bars:** 3.75c, mill, except: 4.05c, Ecorse, Mich.; 4.80c, Los Angeles; 5.50c, Fontana, Calif.

**Cold-Finished Carbon Bars (Base 40,000 lb and over):** 4.00c, mill, except: 3.95c, Pittsburgh, Cumberland, Md.; 4.20c, Indianapolis; 4.25c, Monessen, Pa.; 4.30c, Ecorse, Mich.; 4.35c, St. Louis; 4.36c, Plymouth, Mich.; 4.40c, Newark, N. J.; Hartford, Putnam, Conn.; Mansfield, Readville, Mass.; 4.50c, Camden, N. J.; 5.30c, Los Angeles.

**Cold-Finished Alloy Bars:** 4.65c, mill, except: 4.75c, Monessen, Pa.; 4.85c, Indianapolis; 4.95c, Worcester, Mansfield, Mass., Hartford.

**High-Strength, Low-Alloy Bars:** 5.10c, mill, except 5.30c, Youngstown; 5.40c, Ecorse, Mich.

**Reinforcing Bars (New Billet):** 3.35c, mill, except: 3.55c, Monessen, Pa.; 4.05c, Pittsburgh, Torrance, Calif.; 4.10c, Atlanta, Seattle, S. San Francisco, Los Angeles; 4.25c, Minnequa, Colo. Fabricated: To consumers: 4.25c, mill, except: 5.00c, Seattle.

**Reinforcing Bars (Rail Steel):** 4.65c, Williamsport, Pa., mill; another interest quotes 5.35c, mill.

**Wrought Iron Bars:** Single Refined: 8.60c, (hand puddled), McKees Rocks, Pa.; 9.50c, Economy, Pa. Double Refined: 11.25c (hand puddled), McKees Rocks, Pa.; 11.00c, Economy, Pa. Staybolt: 12.75c, (hand puddled), McKees Rocks, Pa.; 11.30c, Economy, Pa.

## Sheets

**Hot-Rolled Sheets (18 gage and heavier):** 3.25c, mill, except: 3.25-3.30c, Cleveland; 3.30c, Pittsburgh; 3.45c, Ecorse, Mich.; 3.95c, Pittsburgh, Torrance, Calif.; 5.00c, Conshohocken, Pa.; 5.65c, Fontana, Calif.; 6.25c, Kansas City, Mo.

**Hot-Rolled Sheets (19 gage and lighter, annealed):** 4.15c, mill, except: 4.40c, Alabama City, Ala.; 4.65c, Niles, O.; 5.05c, Torrance, Calif.; Kokomo, Ind.

**Cold-Rolled Sheets:** 4.00c, mill, except: 4.20c, Ecorse, Mich.; Granite City, Ill.; 4.95c, Pittsburgh, Calif.

**Galvanized Sheets, No. 10:** (Based on 5 cent zinc) 4.40c, mill, except: 5.00c, Niles, O.; 5.15c, Pittsburgh, Torrance, Calif.; 5.30c, Kokomo, Ind.

**Galvannealed Sheets:** 4.95c, mill, except: 5.05c, Indiana Harbor, Ind.; 5.55c, Niles, O.; 5.70c, Kokomo, Ind.

**Culvert Sheets, No. 16 flat Copper Steel** (based on 5-cent zinc): 5.00c, mill, except: 5.40c, Granite City, Ill.; 5.45c, Kokomo, Ind.; 5.75c, Pittsburgh, Torrance, Calif.

**Long Terns, No. 10 (Commercial quality):** 4.80c, mill.

**Enameling Sheets, No. 12:** 4.40c, mill, except: 4.60c, Granite City, Ill.; 4.70c, Ecorse, Mich.; 6.00c, Niles, O.

**Silicon Sheets, No. 24:** Field: 5.15c, mill. Armature: 5.45c, mill, except: 5.95c, Warren, O.; 6.05c, Niles, O.

**Electrical:** Hot-rolled, 5.95c, mill, except: 6.05c, Kokomo, Ind.; 6.15c, Granite City, Ill.; 6.45c, Warren, O.; 6.55c, Niles, O.

**Motor:** 6.70c mill, except: 6.90c, Granite City, Ill.; 7.20c, Warren, O.

**Dynamo:** 7.50c, mill, except: 7.70c, Granite City, Ill.

**Transformer 72, 8.05c, mill, except: 9.15c, Follansbee, W. Va., Toronto, O.; 10.05c, Brackenridge, Pa.; 65, 8.60c, mill, except: 9.85c, Follansbee, W. Va., Toronto, O.; 10.60c, Brackenridge, Pa.; 58, 9.30c, mill, except: 10.55c, Follansbee, W. Va., Toronto, O.; 11.30c, Brackenridge, Pa.; 52, 10.10c, mill, except: 11.55c, Follansbee, W. Va., Toronto, O.**

**High-Strength Low-Alloy Sheets:** Hot-rolled, 4.95c, mill, except: 5.15c, Youngstown; 5.25c, Ecorse, Mich.; and Conshohocken, Pa., mills. Galvanized (No. 10), 8.75c, mill. Cold-rolled, 6.05c, mill, except: 6.25c, Youngstown; 6.35c, Ecorse, Mich.

**Strip**

**Hot-Rolled Strip:** 3.25c mill, except: 3.30c, Cleveland, Pittsburgh, Riverdale, Ill.; 3.25-1.35c,\* Sharon, Pa.; 3.45c, Ecorse, Mich.; 3.60c, Detroit; 3.65c, Atlanta; 3.70c, West Leechburg, Pa.; 4.00c, Pittsburgh, Torrance, Calif.; 4.25c, Seattle, S. San Francisco, Los Angeles; 4.20c, Kansas City, Mo.; 4.30c, Minnequa, Colo.; 5.90c Fontana, Calif. One company quotes 4.90c, Pittsburgh base.

\* Wider than 6-in. and 6-in. and narrower, respectively.

**Cold-Rolled Strip** (0.25 carbon and less): 4.00c, mill, except 4.00-4.25c, Warren, O.; 4.00-4.50c, Youngstown; 4.20c, Ecorse, Mich.; 4.25c, Riverdale, Ill.; 4.40-4.50c, Detroit; 4.50c, New Haven, Conn., West Leechburg, New Castle, Pa., Boston; 4.75c, Dover, O., New Kensington, Pa.; 4.50-5.00c, Trenton, N. J.; 4.80-5.05c, Wallingford, Conn.; 5.75c, Los Angeles; 7.10c, Fontana, Calif. One company quotes 4.55c, Cleveland or Pittsburgh base, and 4.75c, Worcester, Mass., base; another, 5.00c, Pittsburgh base.

**Cold-Finished Spring Steel:** 0.26-0.40 C, 4.00c, mill, except: 4.25c, Dover, O., Chicago; 4.30c, Worcester, Mass.; 4.50c, New Castle, Pa., Boston, Youngstown; 4.75c, Wallingford, Conn. Over 0.40 to 0.60 C, 5.50c, mill, except: 5.65c, Chicago; 5.75c, Dover, O.; 5.80c, Worcester, Mass., Wallingford, Conn., Trenton, N. J.; 5.95c, Boston; 6.00c, New Castle, Pa. Over 0.60 to 0.80 C, 6.10c, mill, except: 6.25c, Chicago; 6.35c, Dover, O.; 6.40c, Worcester, Mass., Wallingford, Bristol, Conn., Trenton, N. J.; 6.60c, New Castle, Pa. Over 0.80 to 1.05 C, 8.05c, mill, except: 7.85c, Dover, O.; 8.20c, Chicago; 8.35c, Worcester, Mass., Bristol, Conn., Trenton, N. J. Over 1.05 to 1.35 C, 10.35c, mill, except: 10.15c, Dover, O.; 10.30c, Wallingford, Conn.; 10.50c, Chicago; 10.65c, Worcester, Mass., Trenton, N. J.

**Cold-Rolled Alloy Strip:** 9.50c, mill, except: 9.80c, Worcester, Mass.

**High-Strength, Low-Alloy Strip:** Hot-rolled, 4.95c, mill, except: 5.15c, Youngstown; 5.25c, Ecorse, Mich., mill. Cold-rolled, 6.05c, mill, except: 6.25c, Youngstown; 6.35c, Ecorse, Mich., mill.

**Tin, Terne Plate**

**Tin Plate:** American Coke, per base box of 100 lb, 1.25 lb coating \$7.50-\$7.70; 1.50 lb coating \$7.75-7.95. Pittsburgh, Calif., mill \$8.25 and \$8.50, respectively, for 1.25 and 1.50 lb coatings.

**Electrolytic Tin Plate:** Per base box of 100 lb, 0.25 lb tin, \$6.45-6.65; 0.50 lb tin, \$6.70-6.90; 0.75 lb tin, \$7.00-\$7.20.

**Can Making Black Plate:** Per base box of 100 lb, 55 to 123 lb basis weight \$5.75-\$5.85. Pittsburgh, Calif., mill, \$6.50.

**Holloware Enameling Black Plate:** 29-gage, 5.10c, per pound, except: 5.40c, Sparrows Point, Md.; 5.50c, Granite City, Ill.

**Manufacturing Terminals (Special Coated):** Per base box of 100 lb, \$6.65, except: \$6.75 Fairfield, Ala., Sparrows Point, Md.

**Roofing Terminals:** Per package 112 sheets; 20 x 28 in., coating I.C. 8-lb, \$15.50.

**Plates**

**Carbon Steel Plates:** 3.40c, mill, except: 3.40-3.60c, Cleveland; 3.45c, Sparrows Point, Md., Johnstown, Pa., Lackawanna, N. Y.; 3.60c, Pittsburgh; 3.65c, Ecorse, Mich.; 3.75c, Coatesville, Pa.; 3.95c, Claymont, Del., Conshohocken, Pa.; 4.30c, Seattle, Minnequa, Colo.; 4.56c, Houston, Tex.; 5.80c, Fontana, Calif.; 6.10c, Harrisburg, Pa.; 6.25c, Kansas City, Mo.

**Floor Plates:** 4.55c, mill.

**Open-Hearth Alloy Plates:** 4.10c, mill, except:

5.10c, Coatesville, Pa., mill; 5.20c, mill, except: 5.10c, Coatesville, Pa.; 5.30c, Conshohocken, Pa., Sparrows Point, Md., Johnstown, Pa.; 5.40c, Youngstown; 5.65c, Ecorse, Mich., Sharon, Pa.

**Shapes**

**Structural Shapes:** 3.25c, mill, except: 3.30c, Bethlehem, Pa., Lackawanna, N. Y., Johnstown, Altiuppa, Pa.; 3.85c, Torrance, Calif.; 4.15c, Minnequa, Colo.; 4.30c, Seattle, S. San Francisco, Los Angeles; 5.75c, Fontana, Calif.

**Alloy Structural Shapes:** 4.05c, mill.

**Steel Sheet Piling:** 4.05c, mill.

**High-Strength, Low-Alloy Shapes:** 4.95c, mill, except: 5.05c, Bethlehem, Johnstown, Pa., Lackawanna, N. Y.; 5.15c, Youngstown.

**Wire and Wire Products**

**Wire to Manufacturers (carloads):** Bright, Basic or Bessemer Wire, 4.15c, mill, except: 4.25c, Sparrows Point, Md., Kokomo, Ind.; 4.45c, Worcester, Mass.; 4.50c, Monessen, Pa.; Minnequa, Colo., Atlanta, Buffalo; 4.70c, Portsmouth, O.; 4.80c, Palmer, Mass.; 5.10c, Pittsburgh, Calif.; 5.15c, S. San Francisco; 5.40c, Shelton, Conn. One producer

quotes 4.15c, Chicago base; another, 4.50c, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

**Basic MB Spring Wire:** 5.55c, mill, except: 5.30c, Portsmouth, O.; 5.65c, Sparrows Point, Md., Monessen, Pa.; 5.85c, Worcester, Palmer, Mass., Trenton, N. J.; 6.50c, Pittsburgh, Calif.

**Upholstery Spring Wire:** 5.20c mill, except: 5.30c, Sparrows Point, Md., Williamsport, Pa.; 5.50c, Worcester, Mass., Trenton, N. J., New Haven, Conn.; 6.15c, Pittsburgh, Calif.

**Wire Products to Trade (carloads): Merchant Quality Wire:** Annealed (6 to 8 Gage base), 4.80c, mill, except: 4.90c, Sparrows Point, Md.; 4.95c, Monessen, Pa.; 5.10c, Worcester, Mass.; 5.15c, Minnequa, Colo., Kokomo, Ind.; 5.20c, Atlanta; 5.75c, S. San Francisco, Pittsburgh, Calif. One producer quotes 4.80c, Chicago and Pittsburgh base; another, 5.20c, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

**Galvanized (6 to 8 Gage base), 5.25c, mill, except:** 5.35c, Sparrows Point, Md.; 5.40c, Altiuppa, Monessen, Pa.; 5.55c, Worcester, Mass.; 5.60c, Kokomo, Ind., Minnequa, Colo.; 5.65c, Atlanta; 6.20c, Pittsburgh, S. San Francisco, Calif. One producer quotes 5.25c, Pittsburgh and Chicago base; another, 5.65c, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

**Nails and Staples:** Standard, cement-coated and galvanized nails and polished and galvanized staples, Col. 103, mill, except: 105, Sparrows Point, Md., Kokomo, Ind.; 109, Worcester, Mass.; 110, Minnequa, Colo., Atlanta; 117, Portsmouth, O.; 123, Pittsburgh, Calif.; 124, Cleveland; 126, Monessen, Pa.; \$6.75 per 100 pound keg, Conshohocken, Pa., Wheeling, W. Va. One producer quotes Col. 103, Chicago and Pittsburgh base; another, Col. 113, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

**Woven Fence (9 to 15½ Gage, inclusive):** Col. 109, mill, except: 113, Monessen, Pa.; Kokomo, Ind.; 118, Minnequa, Colo.; 121, Atlanta; 132, Pittsburgh, Calif. One producer quotes Col. 109, Pittsburgh and Chicago base; another Col. 114, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

**Barbed Wire:** Col. 123 mill, except: 125, Sparrows Point, Md., Kokomo, Ind.; 128, Atlanta; 128, Monessen, Pa.; 130, Minnequa, Colo.; 143, Pittsburgh, Calif.; 145, S. San Francisco. One producer quotes Col. 123, Chicago and Pittsburgh base.

**Fence Posts (with clamps):** Col. 114, Duluth; 115, Johnstown, Pa.; 116, Moline, Ill.; 122, Minnequa, Colo.; \$123.50 per net ton, Williamsport, Pa.

**Bale Ties (single loop):** Col. 106, mill, except: 108, Sparrows Point, Md., Kokomo, Ind.; 110, Atlanta; 113, Minnequa, Colo.; 130, S. San Francisco, Pittsburgh, Calif. One producer quotes Col. 115, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

**Stainless Steels**

(Mill prices, cents per pound)

**CHROMIUM NICKEL STEELS**

Type	Bars, Wire Shapes	Strip, Cold-Rolled	Sheets
301.....	25.50-28.75	30.50-32.00	37.50-40.75
302.....	25.50-28.75	33.00-33.75	37.50-40.75
303.....	31.00-31.50	36.50-39.75	39.50-43.00
304.....	30.00-31.25	35.00-35.75	39.50-43.00
316.....	46.00-48.00	55.00-57.25	53.00-57.25
321.....	34.00-34.75	44.50-45.75	45.50-49.00
347.....	38.50-39.75	48.50-50.25	50.00-54.00

Type	22-75-23.00	26.50-27.00	32.00-33.00
416.....	23.25-23.50	28.25-33.50	32.50-33.50
430.....	23.25-23.50	27.00-27.50	34.75-35.50
446.....	32.50-33.00	60.00-62.25	46.50-50.00

**STAINLESS-CLAD STEELS**

Type	Plates —Cladding—	Sheets —Cladding—
	10% 20%	10% 20%
302.....	.....	19.75 21.50
304.....	22.50	26.50 20.75 22.50
310.....	32.50	36.50
316.....	27.00	31.00 26.00 28.00
321.....	23.50	27.50
347.....	25.00	29.00 24.00 26.00
405.....	18.75	24.75
410.....	18.25	24.25
430.....	18.25	24.25

**Tool Steels**

**Tool Steel:** Cents per pound, producing plants; reg. carbon 19.00c; extra carbon 22.00c; special carbon 26.50c; oil-hardening 29.00c; high carbon-chromium 52.00c; chrome hot work, 29.00c.

W	Cr	V	Mo	Co	Base Per lb
18	4	1	.....	.....	90.50c
18	4	2	.....	.....	102.50c
18	4	3	.....	.....	114.50c
18	4	2	.....	9	168.50c
1.5	4	1	8.5	.....	65.00c
6.4	4.5	1.9	5	.....	69.50c
6	4	3	6	.....	88.00c

**Tubular Goods**

**Standard Steel Pipe:** Mill prices in carlots, threaded and coupled, to consumers about \$200 a net ton.

In.	Blk.	Gal.	In.	Blk.	Gal.
½.....	39½	17½	1.....	46	25-
¾.....	41½	18	1½.....	48½	27½
1.....	37½	12½	1¾.....	46½	25½
1½.....	39½	14	2.....	49	28
2.....	34	4½	1½.....	47-	26
2½.....	36	9	2.....	49½	28½
3.....	40½	18	2½.....	47½	26½
3½.....	43	21½	3.....	50	29
4.....	43½	22	3½ & 4.....	48-	27-
	46	24½		50½	29½
				44½	22½

In.	Blk.	Gal.	In.	Blk.	Gal.
2.....	39½	17½	38½	16½	27-
					38½ 17
2½.....	42½	20½	41½	19½	32½ 10½
3.....	42½	20½	41½	19½	35- 13-
3½ & 4	42½	20½	43½	21½	41½ 20
5 & 6	42½	20½	43½	21½	38½ 16½
	44½	22½			43½ 22
7.....	.....	.....			43½ 20½

**Line Steel Pipe:** Mill prices in carlots to consumers about \$200 a net ton.

In.	Blk.	Gal.	In.	Blk.	Gal.
½.....	40½	.....	1½.....	46-	26-
¾.....	38½	.....		48	27
1.....	35	.....	1½.....	46½	26½
1½.....	40-	18½		48½	27½
	42	19½	2.....	47-	26½
¾.....	43	22½		49	28
1.....	45	23½	2½ & 3	47½	27
	45½	25½		49½	28½
1½.....	47½	28½	3½ & 4	43½	.....

**Standard Wrought Iron Pipe:** Mill price in carlots, threaded and coupled, to consumers about \$200 a net ton.

In.	Blk.	Gal.	In.	Blk.	Gal.
½.....	59½	95½	1½.....	22	63
¾.....	20½	52½	1½.....	15½	45½
1.....	10½	41½	2.....	7½	36½
1 and 1½	4	32½	2½-3½	5	26
1¾.....	1½	29	4½-8	2	27½
2.....	2	28½	9-12	12	37

**Roller Tubes:** Net base c.l. prices, dollars per 100' of mill, minimum wall thickness, cut lengths 4 to 24", inclusive.

Lengths 4 to 24", inclusive.		Seamless		Elec. Weld	
In.	Ga.	H.R.	C.D.	H.R.	C.D.
1	13	.....	13.39-14.64	13.00	13.00
1½	13	.....	15.87-17.34	13.21	15.39
1¾	13	16.45	17.71-19.35	14.60	17.18
1¾	13	18.71	20.15-22.02	16.60	19.54
2	13	20.96	22.56-24.66	18.60	21.89
2½	13	23.36	25.16-27.50	20.73	24.40
2½	12	23.54-25.73	27.70-30.28	22.83	26.88
2½	12	25.79-28.19	30.33-33.15	25.02	29.41
3	12	27.33-29.87	32.14-35.13	26.51	31.18
3	12	28.68-31.35	33.76-36.90	27.82	32.74
3½	11	33.39-36.50	39.29-42.95	32.39	38.11
3½	11	35.85-39.19	42.20-46.13	34.78	40.94
4	10	44.51-48.65	52.35-57.22	43.17	50.78
4½	9	58.99-64.47	69.42-75.88	.....	.....
5	9	68.28-74.64	80.35-87.82	.....	.....
6	7	104.82-114.57	123.33-134.81	.....	.....

**Pipe Cast Iron:** Class B, 6-in. and over, \$98.50 per net ton, Birmingham; \$106.70, del. Chicago; 4-in. pipe, \$5 higher; Class A pipe, \$5 a ton over Class B.

**Rails, Supplies**

**Rails:** Standard, over 60-lb; \$3.20 per 100 lb mill, except: \$3.50, Indiana Harbor, Ind., and Minnequa, Colo.

**Light (billet):** \$3.55 per 100 lb, mill, except: \$4.25, Minnequa, Colo.

**Light (rail steel):** \$5.10 per 100 lb, Williamsport, Pa.

**Railroad Supplies:** Track bolts, treated: \$8.50 per 100 lb. Untreated: \$8.25, mill.

**Tie Plates:** 4.05c mill, except: 4.20c, Pittsburgh, Torrance, Calif.; 4.50c, Seattle.

**Splice Bars:** 4.25c, mill.

**Standard Spikes:** 5.35c, mill, except: 5.25c, Pittsburgh.

**Axles:** 5.20c, mill.



## RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

## Pig Iron

Per gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., furnace ....	\$48.00	\$48.50	\$49.00	\$49.50
Newark, N. J., del. ....	50.5334	51.0334	51.5334	52.0334
Brooklyn, N. Y., del. ....	...	52.634	53.134	...
Philadelphia, del. ....	50.3002	50.8002	51.3002	51.8002
Birmingham, furnace .....	42.88	43.38	...	...
Cincinnati, del. ....	...	49.43	...	...
Buffalo, furnace .....	47.00	47.00	47.50	48.00
Boston, del. ....	56.20	56.20	56.70	...
Rochester, del. ....	49.35	49.35	49.85	50.35
Syracuse, del. ....	50.2065	50.2065	50.7065	51.2065
Chicago, district furnaces ..	46.00	46.00-46.50	46.50	47.00
Milwaukee, del. ....	47.82	47.82-48.32	48.32	48.82
Muskegon, Mich., del. ....	...	51.28-51.78	51.78	...
Cleveland, furnace .....	46.00	46.50	46.50	47.00
Akron, del. ....	48.3002	48.8002	48.8002	49.3002
Lone Star, Tex., furnace ....	50.00	50.50	...	...
Duluth, furnace .....	...	46.50	46.50	47.00
Erie, Pa., furnace .....	46.00	46.50	46.50	47.00
Everett, Mass., furnace ....	...	52.75	53.25	...
Geneva, Utah, furnace .....	46.00	46.50	...	...
Seattle, Tacoma, Wash., del. ....	...	54.0578	...	...
Portland, Oreg., del. ....	...	54.0578	...	...
Los Angeles, San Francisco	53.5578	54.0578	...	...
Granite City, Ill., furnace ...	47.90	48.40	48.90	...
St. Louis, del. ....	49.40	49.90	50.40	...
Ironton, Utah, furnace .....	55.00	55.50	...	...
Neville Island, Pa., furnace ...	46.00	46.50	46.50	47.00
Pittsburgh, del., N.&S. Sides	47.08	47.58	47.58	48.08
Pittsburgh (Carnegie), furnaces	46.00	...	...	47.00
Sharpsville, Pa., furnace ....	46.00	46.50	46.50	47.00
Steelton, Pa., furnace .....	48.00	48.50	49.00	49.50
Struthers, O., furnace .....	46.00	...	...	...
Swedeland, Pa., furnace ....	50.00	50.50	51.00	...
Toledo, O., furnace .....	46.00	46.50	46.50	47.00
Cincinnati, del. ....	50.5230	51.3230	...	...
Youngstown, O., furnace ....	46.00	46.50	46.50	47.00
Mansfield, O., del. ....	50.1022	50.6022	50.6022	51.1022

† Low phosphorus southern grade.

‡ To Neville Island base add: \$0.86 for McKees Rocks, Pa.; \$1.31 Lawrenceville, Homestead, McKeesport, Monaca; \$1.73 Verona; \$1.94 Brackenridge; \$1.08 for Ambridge and Alliquippa.

§ Includes, in addition to Chicago, South Chicago, Ill., East Chicago, Gary and Indiana Harbor, Ind.

## Blast Furnace Silvery Pig Iron

6.00-6.50 per cent Si (base) .....	\$59.50
6.51-7.00 .....	60.75
7.01-7.50 .....	62.00
7.51-8.00 .....	63.25
8.01-8.50 .....	64.50
8.51-9.00 .....	65.75
F.o.b. Jackson, O., per gross ton	...
Buffalo furnace \$1.25 higher.	...

## Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus \$1 per gross ton.

## Electric Furnace Silvery Pig Iron

Si 14.01-14.50%, \$84.75 furnace, Niagara Falls; \$84 open-hearth and \$85 foundry grade, Keokuk, Iowa. Pigs, Si 18%, \$91, Keokuk, Iowa. Add \$1 a ton for each additional 0.5% Si to 18%; \$1 for each 0.5% Mn over 1%; \$1 a ton for 0.45% max. P.

## Charcoal Pig Iron

Semi-cold blast, low phosphorus. F.o.b. furnace, Lyles, Tenn. \$86 (For higher silicon iron a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

## Low Phosphorus

Steelton, Pa., Troy, N. Y., \$54; Philadelphia, \$56.9736 del. Intermediate phosphorus, Central furnace, Cleveland, \$51.

## Electrodes

(Threaded, with nipples, unboxed)

Diam.	Length	Cents per lb.
		f.o.b. plant
		Graphite
17, 18, 20	60, 72	18.00
8 to 16	48, 60, 72	18.50
7	48, 60	17.75
4, 5 1/2	48, 60	19.00
3	40	19.50
2 1/2	24, 30	21.00
2	24, 30	23.00
		Carbon
40	100, 110	7.50
35	100, 110	7.50
30	84, 110	7.50
24	72 to 104	7.50
17 to 20	84, 90	7.50
14	60, 72	8.00
10, 12	60	8.25
8	60	8.50

## Fluorspar

Metallurgical grade, f.o.b. shipping point, in Ill. Ky., net tons, carloads, effective CaF<sub>2</sub> content, 70% or more, \$37; less than 60%, \$34.

## Metallurgical Coke

Price per Net Ton

	Beehive Ovens
Connellsville, furnace, ..	\$13.50-15.50
Connellsville, foundry, ..	16.00-18.00
New River, foundry, ..	18.50
Wise county, foundry, ..	15.35
Wise county, furnace, ..	14.60
	Oven Foundry Coke
Kearney, N. J., ovens, ..	\$22.00
Everett, Mass., ovens, ..	...
New England, del., ..	23.35
Chicago, ovens, ..	20.40
Chicago, del. ....	21.85
Detroit, del. ....	24.16
Terre Haute, ovens ....	21.00
Milwaukee, ovens ....	21.15
Indianapolis, ovens ....	20.85
Chicago, del. ....	24.19
Cincinnati, del. ....	23.66
Detroit, del. ....	24.61
Ironton, O., ovens ....	19.40
Cincinnati, del. ....	21.63
Painesville, O., ovens, ..	20.90
Buffalo, del. ....	23.42
Cleveland, del. ....	22.55
Erie, del. ....	22.70
Birmingham, ovens ....	17.70
Philadelphia, ovens ....	21.05
Swedeland, Pa., ovens, ..	21.00
Portsmouth, O., ovens, ..	19.50
Detroit, ovens ....	20.65
Detroit, del. ....	21.70
Buffalo, del. ....	22.75
Flint, del. ....	22.98
Pontiac, del. ....	21.98
Saginaw, del. ....	23.30

Includes representative switching charge of: \*, \$1.05; †, \$1.45. ‡ Or within \$4.03 freight zone from works.

## Coal Chemicals

Spot, cents per gallon, ovens (Price effective as of Aug. 5)

Pure benzol .....	20.00
Toluol, one degree ....	20.50-26.50
Toluol, two degrees ....	23.00-26.50
Industrial xylol ....	20.50-26.50
Per ton bulk, ovens	...
Sulphate of ammonia .....	\$45.00
Per pound, ovens	...
(Effective as of Oct. 1)	...
Phenol, 40 (carlots, returnable drums) ....	13.50
Do., less than carlots	14.25
Do., tank cars ....	12.50

(Effective as of Oct. 25)  
Naphthalene flakes, balls, bbl to jobbers, "household use" .... 13.75

## Refractories

(Prices per 1000 brick, f.o.b. plant)

	Fire Clay Brick
Super Duty: St. Louis, Vandalla, Farber, Mexico, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., Ottawa, Ill., \$100. Hard-fired, \$135 at above points.	...
High-heat Duty: Salina, Pa., \$85; Woodbridge, N. J., St. Louis, Farber, Vandalla, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., \$80.	...
Intermediate-Heat Duty: St. Louis, or Vandalla, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., \$74.	...
Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., Bessemer, Ala., Ottawa, Ill., \$66.	...

**Ladle Brick**  
Dry Press: \$55, Freeport, Merill Station, Clearfield, Pa.; Chester, New Cumberland, W. Va.; Irondale, Wellsville, O.  
**Wire Cut:** \$53, Chester, New Cumberland, W. Va.; Wellsville, O.

**Malleable Bung Brick**  
St. Louis, Mo., Olive Hill, Ky., Ottawa, Ill., \$90; Beach Creek, Pa., \$80.

**Silica Brick**  
Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., \$80; Hays, Pa., \$85; Joliet or Rockdale, Ill., E.

Chicago, Ind., \$89; Lehi, Utah, Los Angeles, \$95.

Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., Birmingham, \$80.

Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., \$81.

## Basic Brick

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Burned chrome brick, \$66; chemical-bonded chrome brick, \$69; magnesite brick, \$91; chemical-bonded magnesite, \$50.

## Magnesite

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)

Domestic dead-burned, % grains; Bulk, \$30.50-31.00; single paper bags, \$35.00-35.50.

## Dolomite

(Base prices per net ton)

Domestic, dead-burned bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Nardo, Millersville, Martin, Gibsonsburg, Woodville, O., \$12.25; Thornton, McCook, Ill., \$12.35; Dolly Siding, Bonne Terre, Mo., \$12.45.

## Ores

## Lake Superior Iron Ore

Gross ton, 51 1/2% (natural)

## Lower Lake Ports

(Any increase or decrease in R.R. freight rates, dock handling charges and taxes thereon effective after Dec. 31, 1948, are for buyer's account.)

Old range bessemer .....	\$7.60
Old range nonbessemer .....	7.45
Mesabi bessemer .....	7.35
Mesabi nonbessemer .....	7.20
High phosphorus .....	7.20

## Eastern Local Ore

Cents, units, del. E. Pa. Foundry and basic 56.62% concentrates, contract .... 16.00

## Foreign Ore

Cents per unit, c.i.f. Atlantic ports  
Swedish basic, 60 to 68% ... 15.00  
Brazil iron ore, 68-69% ... 19.50

## Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid ..... \$26-\$28

## Manganese Ore

48-50%, duty paid, f.o.b. cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 67.60c-72.60c.

## Chrome Ore

Gross ton f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S.C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash.

(S & paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	...
48% 2.8:1 .....	\$37.50
48% 3:1 .....	39.00
48% no ratio .....	31.00
South African (Transvaal)	...
44% no ratio .....	\$25.50-\$26.00
45% no ratio .....	26.50
48% no ratio .....	29.00-30.00
50% no ratio .....	29.50-30.50

Brazilian—nominal  
44% 2.5:1 lump..... \$33.65

Rhodesian  
45% no ratio ..... \$27-\$27.50  
48% no ratio ..... 30.00  
48% 3:1 lump ..... 39.00

Domestic (seller's nearest rail)  
48% 3:1 ..... \$39.00

## Molybdenum

Sulphide conc., lb, Mo., cont., Mines ..... \$0.90

## WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras.

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H-R 10 Ga.	C-R 17 Ga.	Gal. *10 Ga.	H-R	C-R	H-R Rds. 3/8" to 3"	C-F Rds. 1/2" & up	H-R Alloy **4140		Carbon 3/8"-3/4"	Floor 3/4" & Thicker
New York (city)	5.80	6.76	7.91	5.92	...	5.80	6.61	8.68	5.53	5.90	7.51
New York (c'try)	5.60	6.56	7.71	5.72	...	5.60	6.41	8.48	5.33	5.70	7.31
Boston (city) ..	6.10	6.70	8.00	6.10	...	5.67	6.42	8.72	5.57	5.95	7.40
Boston (c'try) .	6.95	6.55	7.85	5.95	...	5.52	6.27	8.57	5.42	5.80	7.25
Phila. (city)...	5.72	6.64	7.53-7.58	5.60	...	5.55	6.34	8.40	5.25	5.53	6.74
Phila. (c'try) ..	5.57	6.59	7.38-7.43	5.45	...	5.40	6.19	8.25	5.10	5.38	6.59
Balt. (city) ...	5.46†	6.36	7.26	5.52	...	5.57	6.31	...	5.51	5.71	7.16
Balt. (c'try)...	5.31†	6.21	7.11	5.37	...	5.42	6.16	...	5.36	5.56	7.01
Norfolk, Va. ..	5.80	...	...	...	...	6.05	7.05	...	6.05	6.05	7.55
Wash. (w'hse) .	5.84-6.00	...	...	5.90	...	5.91-5.95	6.61	...	5.85-5.89	6.05-6.09	7.50-7.54
Buffalo (del.)..	5.00	5.90	7.85	5.49	6.50	5.20	6.05	10.13	5.25	5.50	7.06
Buffalo (w'hse)	4.85	5.75	7.70	5.34	6.35	5.05	5.90	9.98	5.10	5.35	6.91
Pitts. (w'hse) ..	4.85-5.00‡	5.75-5.85‡	7.15	5.00-5.10	5.95-6.00	4.90-5.10	5.65	9.60	4.90-5.15	5.05-5.25	6.55
Detroit (w'hse).	4.85-5.00‡	5.75-5.85‡	7.15	5.00-5.35	5.95-6.00	5.45	6.17	8.12	5.45	5.65-5.80	7.10
Cleveland (del.)	5.13-5.90††	5.90-6.31	7.35-8.10††	5.18-5.31	6.60-6.85	5.32-5.36	6.05-6.12	8.24-8.56	5.35-5.62	5.52-5.56	6.95-7.01
Cleve. (w'hse).	4.98-5.75	5.75-6.16	7.20-7.95	5.03-5.16	6.70	5.17-5.21	5.90-5.97	8.24-8.41	5.21-5.47	5.37-5.41	6.80-6.86
Cincin. (w'hse).	5.29	6.14	7.63	5.55	6.10	5.55	6.10	...	5.40	5.64	6.94
Chicago (city) .	5.20	5.90‡	7.30	5.00	6.67-6.80	5.05	5.85	8.25‡	5.05	5.25	6.70
Chicago (w'hse)	4.85-5.05	5.75‡	7.15	4.85	6.52-6.65	4.90	5.70	8.10‡	4.90	5.10	6.55
Milwaukee(city)	5.38	6.08‡	7.48	5.18	6.82-6.98	5.23	6.03	8.43‡	5.23	5.43	6.88
St. Louis (del.)	5.34‡	6.24‡	7.44	5.34	6.64	5.39	6.19‡	6.64	5.39	5.59	7.04
St. L. (w'hse).	5.19‡	6.09‡	7.29	5.19	6.49	5.24	6.04‡	9.49	5.24	5.44	6.89
Birm'ham (city)	5.20‡	...	6.60	5.20	...	5.15	6.66-6.83	...	5.15	5.40	7.41-7.73‡
Birm'ham (c'try)	5.05‡	...	6.45	5.05	...	5.00	6.51-6.68	...	5.00	5.23	7.26-7.58‡
Omaha, Nebr. .	6.07	...	9.33	6.07	...	6.12	6.92	...	6.12	6.32	7.77
Los Ang. (city)	6.60‡	8.05	8.90†	6.80	9.50	6.25	8.20	...	6.10	6.30	8.20
L. A. (w'hse)	6.45‡	7.90	8.75†	6.65	9.35	6.10	8.05	...	5.95	6.15	8.05
San Francisco	5.95‡‡	7.15	8.05	6.75‡‡	8.25‡‡	5.90‡‡	7.55	10.20††	5.90	7.60	8.10
Seattle-Tacoma.	6.35††	7.90‡	8.40	6.70††	...	6.20††	8.15†	9.45‡	6.30††	6.35††	8.40††

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; 1—1500 lb and over; 2—1000 to 4999 lb; 3—450 to 39,999 lb; 4—three to 24 bundles; 5—450 to 14,999 lb; 6—400 to 14,999 lb; 7—400 to 14,999 lb; 8—1000 to 1999 lb; 9—1000 to 39,999 lb; 10—1000 lb and over; 11—2000 lb and over; 12—300 to 999 lb; 13—1500 to 1999 lb; 14—1500 to 39,999 lb; 15—400 to 3999 lb; 16—400 lb and over; 17—500 to 1499 lb; 18—Price (but not other price in range) applies to any and all quantities.

\* Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; § 18 gage and heavier; \*\* as rolled; †† add 0.40 for sizes not rolled in Birmingham; †† top level of quoted range is nominal.

## Bolts, Nuts

Prices to consumers, f.o.b. midwestern plants. Sellers reserve right to meet competitors' prices, if lower. Additional discounts on carriage and machine bolts, 5 for carloads; 15 for full containers, except tire and plow bolts.

## Carriage and Machine Bolts

1/2-in. and smaller; up to 6 in. in length	35 off
3/4 and 1/2 x 6-in. and shorter	37 off
1/2-in. and larger x 6-in. and shorter	34 off
All diameters longer than 6-in.	30 off
Tire bolts	25 off
Plow bolts	47 off
Lag bolts, 6 in. and shorter	37 off
Lag bolts, longer than 6 in.	35 off

## Stove Bolts

In packages, nuts separate, 58 1/2-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

## Nuts

	A.S. f.o.b.	A.S. Reg.	Heavy
Semifinished hexagon	41 off	...	...
1/2-in. and smaller	41 off	...	38 off
3/4-in. and smaller	39 off	...	...
1/2-in.-1-in.	...	...	37 off
3/4-in.-1-in.	...	...	35 off
1 1/2-in.-1 1/2-in.	37 off	...	35 off
1 1/2-in. and larger	34 off	...	28 off

Additional discount of 15 for full containers.

Hexagon Cap Screws  
(Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright)	46 off
Upset (1035 heat treated)	40 off
1/2 and smaller x 6 and shorter	40 off
3/4, 1, & 1 1/2 x 6-in. and shorter	35 off

## Square Head Set Screws

Upset 1-in. and smaller	51 off
Headless, 1/2-in. and larger	31 off

## Rivets

F.o.b. midwestern plants

Structural 1/2-in. and larger	6.75c
3/4-in. and under	48 off

## Washers, Wrought

F.o.b. shipping point, to jobbers. Net to \$1 off

## FERROALLOY PRODUCT PRICES

## MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton, \$62, Palmerton, Pa.; \$66, Pitts-burgh and Chicago; (16% to 19% Mn) \$1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk \$160 per gross ton of alloy, c.l., packed, \$172; gross ton lots, packed, \$187; less gross ton lots, packed, \$204; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price: \$165, Rockwood, Tenn.; \$162, f.o.b. Birmingham and Johnstown, Pa.; \$160, Sheridan, Pa.; \$163, Etina, Pa. Shipment from Pacific Coast warehouses by one seller add \$31 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, \$201; less gross ton lots, \$218 f.o.b. Chicago. Add or subtract \$2 for each 1%, or fraction thereof, of contained manganese over 82% and under 78%, respectively.

\*Contract price with spot \$12 higher. Effective Apr. 1, contract price also will be \$172, Sheridan, Pa.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. Special Grade: (Mn 90% approx., C 0.07% max., P. 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Carload, 2" x D, packed 35.5c per lb of metal, ton lot 37c, less ton 39c. Delivered. Spot, add 2c.

Manganese, Electrolytic: Less than 250 lb, 35c; 250 lb to 1999 lb, 32c; 2000 to 35,999 lb, 30c; 36,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound. F.o.b.

cars Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 19-20% Si, 8.6c per lb of alloy, carload packed, 9.35c, ton lot 10.25c, less ton 11.25c. Freight allowed. For 2% C grade, Si 15-17.5%, deduct 0.2c from above prices. Spot, add 0.25c.

## CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 20.5c per lb of contained Cr, c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

'SM' High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., 8MxD, bulk 22.0c per lb of contained Cr, c.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.03% C, 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

'SM' Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.5c, ton lot 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract, carload, 1" x D; packed, max. 0.50% C grade, \$1.03 per lb of contained chromium, ton lot \$1.05, less ton \$1.07. Delivered. Spot, add 5c.

(Please turn to Page 188)



# Expect Stable Nonferrous Market

Present patterns expected to continue through first half of 1949. Government programs will play major part in second half developments. Copper supply improving

**New York**—Consensus in metal circles here is that the nonferrous metal markets generally will continue their present patterns through the first half of this year. Developments beyond midyear will depend mainly upon changes that may be effected in connection with the government's stockpiling program, ECA commitments and the trend of domestic demand. All major primary markets held unchanged last week.

**Copper**—Although some consumers of copper are curtailing operations, all the slack in demand for the metal is being taken up by other consumers. Producers are unable to fill inquiries for March delivery fully. The supply situation is showing gradual improvement with operations at Kennecott Copper Corp.'s Utah properties being restored to normal. Three-fourths of the levels in the Bingham open-pit mine are in operation and the mine shortly will be producing 70,000 tons of ore daily.

**Lead**—Shipments of refined lead to domestic consumers increased 6860 tons during January to a total of 52,716 tons, the largest since October, 1947, according to the American Bureau of Metal Statistics. Production of refined lead totaled 51,230 tons in January, or about 1100 tons less than in December. Primary output during the month was off slightly to 48,775 tons from 49,667 tons in December. Total stocks of lead at refineries at the close of January declined to 38,656 tons from 40,647 tons on hand at the end of December.

Consumers are drawing more heavily on their reserves to cover current needs in an effort to reduce inventories. They are placing new orders more cautiously, therefore, and on shorter notice. Prices remained unchanged last week at 21.30c to 21.35c, St. Louis.

**Zinc**—Pressure for zinc deliveries has been lifted from the domestic market, but producers still have no difficulty in disposing available supplies. Galvanizers of sheet and pipe account for bulk of new demand. Prime western held last week at 17.50c, East St. Louis.

**Tin**—Production of refined tin by the Longhorn smelter, Texas City, Tex., amounted to 3254 tons in February compared with 3257 tons in January and 2800 tons in February, 1948. According to an authority in the trade, it is doubtful whether users of tin would be taking any more than 5500 tons per month, or at the rate of 66,000 tons a year, if permitted to obtain all they pleased. This opinion was expressed in discussion of the forthcoming expiration, unless extended, of the distribution and use controls over tin. This

authority claims that world production of tin is running in excess of what the consumption would be if restrictions everywhere were lifted. The government has purchased quickly all tonnages which have been allocated to this country by the Combined Tin Committee.

**Brass and Bronze Ingots**—Leading producers of brass and bronze ingots reduced prices  $\frac{1}{2}$  to 1 cent a pound on Feb. 23. Prices were cut 1 cent a pound on alloys in the 85-5-5-5 group; 1 cent on alloys in the 80-10-10 group; 1 cent on ingots Nos. 215 and 245 and  $\frac{1}{2}$ -cent on ingot No. 210 in the '88-10-2 group;  $\frac{1}{2}$ -cent on No. 405 yellow ingot. In the

## Metal Price Averages For February

Electrolytic Copper, del.	
Conn. ....	23.500
Lead, St. Louis. ....	21.325
Prime, Western Zinc,	
E. St. Louis. ....	17.500
Straits Tin, New York. ....	103.000
Primary Aluminum	
Ingots, del. ....	17.000
Antimony, f.o.b. Laredo,	
Tex. ....	38.500
Nickel, f.o.b. refinery. .	40.000
Silver, New York. ....	70.838

manganese bronze group, ingot No. 421 was cut  $\frac{1}{2}$ -cent while silicon bronze ingots held unchanged.

**Aluminum**—Remelt aluminum ingot prices have been reduced rather sharply by some smelters. The price reductions were attributed to lower scrap costs. The new prices reflect reductions ranging from 1 to  $2\frac{1}{2}$  cents per pound on the foundry alloys, while the steel deoxidizing grades show reductions ranging from  $\frac{1}{2}$  to 1-cent a pound.

## Favors Two-Year Suspension

**Phoenix, Ariz.**—Although it is believed that the 4-cent excise tax on foreign copper will be necessary again at some time in the future, the Arizona Copper Tariff Board has agreed not to protest passage of H. R. 260 (Patterson bill) which authorizes the suspension of the 4-cent excise tax on copper for a further period of two years. The present suspension period ends Mar. 31.

The board recognizes the fact that there is a temporary situation existing whereby the domestic copper mines cannot supply sufficient metal for domestic needs, and believes that while there is a material actual shortage, copper of foreign origin

should be permitted to enter the United States duty free. The board also believes there should be a definite and short-time limitation on any move to freely admit foreign copper into this country as the time will come when domestic production will be ample to satisfy all domestic copper requirements.

Charles H. Dunning, director, Department of Mineral Resources, also has expressed the willingness of his group to a two-year suspension of the excise tax.

This same position has been taken by the group of copper producers who traditionally have advocated the excise tax. In other words, they are in accord with the two-year suspension of the import tax, as a purely temporary measure.

## Platinum Price Drops \$3

**New York**—Price of platinum has been reduced \$3 an ounce further by the leading refiner of the metal. The new price is \$78 an ounce for large quantities and \$81 for retail lots.

Platinum price has been reduced \$15 an ounce so far this year. It was \$93 to \$96 an ounce at the start of 1949, was lowered \$5 on Jan. 24, \$3 on Feb. 15 and \$4 on Feb. 23.

The cuts by platinum refiners have brought their quotations in line with lower prices that have been prevailing for metal sold by dealers and brokers. At the same time, platinum authorities say jewelry trade demand for the metal has been sharply curtailed while industrial buying has been below normal.

## Plans West Coast Brass Mill

**Los Angeles**—One of the largest nonferrous plants to be erected in the West since the war will be built near this city by American Brass Co. This was announced by Earle V. Grover, president of Apex Steel Co. and president of the Los Angeles Chamber of Commerce, who said that a 45-acre tract has been purchased by American Brass. The new mill will produce sheets, wire, rods and tube.

## Lead Mine Output Steady

**Washington**—Despite a continued high industrial demand for lead and an all-time record market price, domestic mine output of recoverable lead in 1948 remained virtually unchanged from 1947, according to the Bureau of Mines. Work stoppages due to labor-management disputes curtailed lead production in certain areas and were the greatest single factor to impede the obtaining of greater supplies from domestic mines in 1948. The work stoppage which shut down for eleven weeks the St. Joseph Lead Co. mines, mills and smelter in southeastern Missouri was estimated to have been responsible for the loss of 25,000 tons of lead. Work stoppages during the year curtailed lead outputs in other areas, notably the Tri-State district and northeastern Washington.

Production in 1948 was 386,932 short tons, compared with 384,221 tons in 1947.

# NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted)

**Copper:** Electrolytic, 23.50c, Conn. Valley; Lake, 23.62½c, Conn. Valley.

**Brass Ingot:** 85-5-5-5 (No. 115) 18.75-20.00c; 88-10-2 (No. 215) 29.50c; 80-10-10 (No. 305) 26.25c; No. 1 yellow (No. 405) 15.75-17.00c.

**Zinc:** Prime western 17.50c, brass special 17.75c, intermediate 18.00c, East St. Louis; high grade 18.50c, delivered.

**Lead:** Common 21.30-21.35c, chemical and corroding 21.40c, St. Louis.

**Primary Aluminum:** 99% plus, ingots 17.00c, pigs 16.00c. Base prices for 10,000 lb and over, f.o.b. shipping point.

**Secondary Aluminum:** Piston alloy (6-6 type) 21.00-22.00c; No. 12 foundry alloy (No. 2 grade) 20.50-21.25c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.50-24.00c; grade 2, 22.25-22.50c; grade 3, 21.25-21.50c; grade 4, 20.75-21.00c. Prices include freight at carload rate up to 75 cents per 100 lb.

**Magnesium:** Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, f.o.b. Freeport, Tex.

**Tin:** Grade A, 99.8% or higher (including Straits) \$1.03; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, \$1.023; grade C, 99.65-99.79%, incl., \$1.024; 99.9-99.949% \$1.024, grade F, 98.98-99.9% \$1.015 for tin content. Prices are ex-dock, New York, in 5-ton lots.

**Antimony:** American 99-99.8% and over but not meeting specifications below, 35.50c; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 39.00c, f.o.b. Laredo, Tex., for bulk shipments.

**Nickel:** Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

**Mercury:** Open market, spot, New York \$88-\$94 per 76-lb flask.

**Beryllium-Copper:** 3.75-4.25% Be, \$24.50 per lb contained Be.

**Cadmium:** "Regular" straight or flat forms, \$2 del.; special or patented shapes, \$2.10.

**Cobalt:** 97-98%, \$1.65 per lb for 550 lb (keg); \$1.67 per lb for 100 lb (case); \$1.72 per lb under 100 lb.

**Gold:** U. S. Treasury, \$35 per ounce.

**Silver:** Open market, New York, 71.50c per ounce.

**Platinum:** \$78-\$81 per ounce.

**Palladium:** \$24 per troy ounce.

**Iridium:** \$100-\$110 per troy ounce.

**Titanium** (sponge form): \$5 per pound.

## Rolled, Drawn, Extruded Products

### COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill)

**Sheet:** Copper 37.18; yellow brass 34.68; commercial bronze, 95%, 37.23; 90%, 36.88; red brass, 85%, 36.01; 80%, 35.66; best quality, 35.33; nickel silver, 13%, 46.92; phosphor-bronze, grade A, 5%, 56.05.

**Rods:** Copper, hot rolled 33.28; cold drawn 34.28; yellow brass, free cutting, 29.24; commercial bronze, 95% 36.92; 90% 36.57; red brass, 85% 35.70; 80% 35.35.

**Seamless Tubing:** Copper 37.22; yellow brass 37.60; commercial bronze 90% 39.54; red brass 85% 38.92; 80% 38.57.

**Wire:** Yellow brass 34.88; commercial bronze, 95% 37.52; 90% 37.17; red brass, 85% 36.30; 80% 35.95; best quality brass 35.62.

**Copper Wire:** Bare, soft, f.o.b. eastern mills, c.l. 29.42½c, i.c.l. 29.92½-30.05c; weather-proof, f.o.b. eastern mills, c.l. 29.60-29.85c, i.c.l. 30.35c; magnet, delivered, c.l. 32.75-33.50c, 15,000 lb or more 33.00-33.75c, i.c.l. 33.50-34.25c.

## DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	tinmoy	Nickel	Silver
Feb. Avg. ....	23.50	21.235	17.50	103.00	17.00	38.50	40.00	70.838
Jan. Avg. ....	23.50	21.325	17.50	103.00	17.00	38.50	40.00	70.00
Feb. 1-10 ....	23.50	21.30-21.35	17.50	103.00	17.00	38.50	40.00	70.00
Feb. 11-12 ....	23.50	21.30-21.35	17.50	103.00	17.00	38.50	40.00	71.00
Feb. 14 ....	23.50	21.30-21.35	17.50	103.00	17.00	38.50	40.00	71.50
Feb. 15-28 ....	23.50	21.30-21.35	17.50	103.00	17.00	38.50	40.00	71.50
Mar. 1-3 ....	23.50	21.30-21.35	17.50	103.00	17.00	38.50	40.00	71.50

**NOTE:** Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

### ALUMINUM

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle†
0.249-0.136	12-48	28.9	...	...
0.135-0.096	12-48	27.4	...	...
0.095-0.077	12-48	27.9	26.0	29.6
0.078-0.068	12-48	28.5	26.2	29.8
0.067-0.061	12-48	28.5	26.2	29.8
0.060-0.043	12-48	28.7	26.4	30.1
0.047-0.038	12-48	29.1	26.6	30.4
0.037-0.030	12-48	29.5	27.0	30.9
0.029-0.024	12-48	29.9	27.3	31.3
0.023-0.019	12-36	30.5	27.7	31.8
0.018-0.017	12-36	31.1	28.3	32.6
0.016-0.015	12-36	31.8	28.9	33.5
0.014	12-24	32.7	29.7	34.6
0.013-0.012	12-24	33.6	30.4	35.5
0.011	12-24	34.6	31.3	36.7
0.010-0.0095	12-24	35.6	32.3	38.0
0.009-0.0085	12-20	36.8	33.4	39.5
0.008-0.0075	12-20	38.1	34.6	41.1
0.007	12-18	39.5	35.9	42.9
0.006	12-18	41.0	37.2	47.0

\* Minimum length, 60 inches. † Maximum diameter, 24 inches.

**Screw Machine Stock:** 5000 lb and over.

Diam. (in.) or distance across flats	Round— R317-T4, 17S-T4	Hexagonal— R317-T4	17S-T4
0.125	48.0	...	...
0.156-0.203	41.0	...	...
0.219-0.313	38.0	...	...
0.344	37.0	...	47.0
0.375	36.5	45.5	44.0
0.406	36.5	...	...
0.438	36.5	45.5	44.0
0.469	36.5	...	...
0.500	36.5	45.5	44.0
0.531	36.5	...	...
0.563	36.5	...	41.5
0.594	36.5	...	...
0.625	36.5	43.0	41.5
0.656	36.5	...	...
0.688	36.5	...	41.5
0.750-1.000	35.5	40.5	39.0
1.063	35.5	...	37.5
1.125-1.500	34.5	39.0	37.5
1.563	34.5	...	37.5
1.625	33.5	...	36.5
1.688-2.000	33.5	...	...
2.125-2.500	32.5	...	...
2.625-3.375	31.5	...	...

### LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, \$27.25 per cwt.; add 50c per cwt., 10 sq ft to 140 sq ft. Pipe: Full coils, \$27.25 per cwt; cut coils, \$27.50. Traps and Bends: List price plus 70%.

### ZINC

Sheets, 22.00-22.50c, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 20.75-21.50c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 19.75-20.50c; over 12-in., 20.75-21.50c.

### NICKEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes 56.00c. Plates 55.00c. Seamless tubes, 89.00c.

### MONEL

(Base prices, f.o.b. mill.)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c. Seamless tubes, 80.00c. Shot and blocks, 40.00c.

### MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb. 52.00-56.00c; 25 to 99 lb. 42.00-46.00c; 100 lb to 4000 lb, 35.00-36.00c.

## Plating Materials

**Chromic Acid:** 99.9%, flake, f.o.b. Philadelphia, carloads, 26.00c, 5 tons and over 26.50c; 1 to 5 tons, 27.00c; less than 1 ton, 27.50c.

**Copper Anodes:** Base, 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat untrimmed 33.84c; oval 33.34c; electrodeposited, 31.09c; cast, 30.12c.

**Copper Cyanide:** 70-71% Cu, 100-lb drums, 48.00c, f.o.b. Niagara Falls, N. Y.

**Sodium Cyanide:** 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 18.00c; 1000 to 19,900 lb, 17.00c, f.o.b. Niagara Falls, N. Y.

**Carbonate:** 54-56% metallic Cu; 50 lb bags, up to 250 lb, 26.25c; over 250 lb, 25.25c, f.o.b. Cleveland.

**Nickel Anodes:** Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 100 lb, 64.00c; f.o.b. Cleveland. Add 1 cent for rolled depolarized.

**Nickel Chloride:** 100-lb kegs, 26.50c; 400-lb bbl, 24.50c, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

**Tin Anodes:** Bar, 1000 lb and over 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 200 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb, 121.75c; 200 to 499 lb, 122.25c; less than 200 lb, 123.75c f.o.b. Seawen, N. J.

**Sodium Stannate:** 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb, 61.2c; 2000 to 9900 lb, 59.4c. Prices f.o.b. Seawen, N. J. Freight not exceeding St. Louis rate allowed.

**Zinc Cyanide:** 100-lb drums 42.50c, f.o.b. Cleveland; 43.00c, Detroit; 42.00c, f.o.b. Philadelphia.

**Stannous Sulphate:** Less than 2000 lb in 100 lb kegs, 100.00c; in 400 lb bbl, 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c; in 400 lb bbl, 98.00c, f.o.b. Carteret, N. J.

**Stannous Chloride** (anhydrous): In 400 lb bbl, 97.00c; in 100 lb kegs, 98.00c, f.o.b. Carteret, N. J.

## Scrap Metals

### BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb f.o.b. shipping point.

	Clean	Rod	Clean
	Heavy	Ends	Turnings
Copper .....	21.125	21.125	20.375
Yellow brass .....	18.875	18.625	18.125
Commercial Bronze			
95% .....	20.250	20.000	19.500
90% .....	20.125	19.875	19.375
Red brass .....			
85% .....	20.000	19.750	19.250
80% .....	19.875	19.625	19.125
Best Quality (71-79%)	19.750	19.500	19.000
Muntz Metal .....	18.250	18.000	17.500
Nickel, silver, 10% ..	20.250	20.000	19.125
Phos. bronze, A .....	22.625	22.375	21.375
Naval brass .....	18.750	18.500	18.000
Manganese bronze ..	18.750	18.500	17.875

### BRASS INGOT MAKERS

#### BUYING PRICES

(Cents per pound, f.o.b. shipping point, carload lots)

No. 1 copper 18.50-19.00, No. 2 copper 17.50-18.00, light copper 16.50-17.00, composition red brass 14.25-14.50, auto radiators 12.25-12.50, heavy yellow brass 10.75-11.00.

### REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 19.50, No. 2 copper 18.50, light copper 17.50, refinery brass (60% copper), per dry copper content 17.50.

### DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

**Copper and Brass:** Heavy copper and wire No. 1 17.75-18.00, No. 2 16.75-17.00, light copper 15.75-16.00, No. 1 composition red brass 12.50-12.75, No. 1 composition turnings 12.00-12.25, mixed brass turnings 8.00-8.25, new brass clippings 15.25-15.75; No. 1 brass rod turnings 9.00-9.25, light brass 6.50-6.75, heavy yellow brass 9.00-9.25, new brass rod ends 11.75-12.25, auto radiators, unsweated 10.50-11.00, cocks and faucets 10.75-11.00, brass pipe 10.75-11.00.

**Lead:** Heavy 13.50-14.00, battery plates 7.00-7.50, linotype and stereotype 15.00-15.50, electrolyte 13.50-14.00, mixed babbitt 19.00-19.50, solder joints, 22.00-23.00.

**Zinc:** Old zinc 8.00-8.50, new die cast scrap 8.50-9.00, old die cast scrap 5.50-6.00.

**Tin:** No. 1 pewter 64.00-66.00, block tin pipe 82.00-83.00, No. 1 babbitt 50.00-53.00, siphon tops 49.00-51.00.

**Aluminum:** Clippings 28 13.00-14.00, old sheets 8.50-9.00, crankcase 8.50-9.00, borings and turnings 4.00-4.50, pistons, free of struts, 8.50-9.00.



## OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

## PITTSBURGH

No. 1 Hvy. Melt. ....	\$39.00
No. 2 Hvy. Melt. ....	37.00
No. 1 Busheling. ....	39.00
No. 1 Bundles. ....	39.00
No. 2 Bundles. ....	37.00
No. 3 Bundles. ....	35.00-36.00
Machine Shop Turnings	27.00-28.00*
Mixed Borings, Turnings	27.00-28.00*
Short Shovel Turnings. ....	29.50-30.00
Cast Iron Borings. ....	26.00-27.00*
Bar Crops and Plate. ....	45.50-46.50
Low Phos. Steel. ....	44.00-45.00
Heavy Turnings. ....	35.50-37.50

## Cast Iron Grades†

Mixed Yard. ....	45.00-46.00
No. 1 Machinery Cast. ....	59.00-60.00
Charging Box Cast. ....	49.00-50.00
Heavy Breakable Cast. ....	48.00-49.00
Brake Shoe. ....	47.00-48.00

## Railroad Scrap

No. 1 R.R. Heavy Melt. ....	42.00
Axles. ....	51.00-53.50
Rails, Random Lengths	47.00-48.00*
Rails, 3 ft and under. ....	53.00-54.00
Rails, 18 in. and under. ....	54.00-55.00
Railroad Specialties. ....	48.00-50.00
Angles, Splice Bars. ....	54.00-55.00

\* Brokers' buying prices.  
† Nominal.

## CLEVELAND

No. 1 Heavy Melt. Steel	\$36.00-37.00
No. 2 Heavy Melt. Steel	35.00-36.00
No. 1 Busheling. ....	36.00-37.00
No. 2 Bundles. ....	34.00-35.00
Machine Shop Turnings	24.00-24.50
Mixed Borings, Turnings	27.00-27.50
Short Shovel Turnings. ....	27.00-27.50
Cast Iron Borings. ....	27.00-27.50
Bar Crops and Plate. ....	39.00-39.50
Punchings & Plate Scrap	39.00-39.50
Cut Structural. ....	41.00-42.00

## Cast Iron Grades

No. 1 Cupola. ....	48.00-49.00
Charging Box Cast. ....	43.00-44.00
Stove Plate. ....	43.00-44.00
Heavy Breakable Cast. ....	40.00-40.50
Unstripped Motor Blocks	40.00-40.50
Malleable. ....	48.00-49.00
Brake Shoes. ....	41.00-42.00
Clean Auto Cast. ....	48.00-49.00
No. 1 Wheels. ....	47.00-48.00
Burnt Cast. ....	42.00-43.50

## Railroad Scrap

No. 1 R.R. Heavy Melt	40.50-41.50
R.R. Malleable. ....	40.00-45.00
Rails, Random Lengths	58.00-60.00
Rails, 3 ft and under. ....	46.00-48.00
Rails, 3 ft and under. ....	54.00-56.00
Cast Steel. ....	51.00-52.00
Railroad Specialties. ....	51.00-52.00
Uncut Tires. ....	46.00-48.00
Angles, Splice Bars. ....	51.00-52.00

## VALLEY

No. 1 Heavy Melt. Steel	\$37.50-38.00
No. 2 Heavy Melt. Steel	37.50-38.00
No. 1 Bundles. ....	37.50-38.00
Machine Shop Turnings	21.00-23.00
Short Shovel Turnings	24.00-25.00
Cast Iron Borings. ....	24.00-25.00
Low Phos. ....	42.00-42.50

## Railroad Scrap

No. 1 R.R. Heavy Melt.	41.50-42.00
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## MANSFIELD

Machine Shop Turnings	\$28.00-29.00
Short Shovel Turnings	30.00-31.00

## CINCINNATI

No. 1 Heavy Melt. Steel	\$31.00
No. 2 Heavy Melt. Steel	30.00
No. 1 Busheling. ....	31.00
Nos. 1 & 2 Bundles. ....	31.00

Machine Shop Turnings	21.00
Mixed Borings, Turnings	21.00
Short Shovel Turnings. ....	23.00
Cast Iron Borings. ....	22.00

## Cast Iron Grades

No. 1 Cupola Cast. ....	48.00
Charging Box Cast. ....	39.00
Heavy Breakable Cast. ....	38.00
Stove Plate. ....	39.00
Unstripped Motor Blocks	34.00
Brake Shoes. ....	36.00
Clean Auto Cast. ....	48.00
Drop Broken Cast. ....	52.00

## Railroad Scrap

No. 1 R.R. Heavy Melt.	34.00
R.R. Malleable. ....	46.00
Rails, Random Lengths	48.00
Rails, 18 in. and under	50.00

## DETROIT

(Brokers' buying prices,  
f.o.b. shipping point)

No. 2 Heavy Melt. Steel	\$29.50-30.00
No. 1 Busheling. ....	32.50-33.00
No. 1 Low-phos. ....	33.50-34.00
No. 2 Bundles. ....	29.50-30.00
Machine Shop Turnings	20.50-21.00
Mixed Borings, Turnings	21.50-22.00
Short Shovel Turnings. ....	22.50-23.00
Cast Iron Borings. ....	22.00-23.00
Punchings & Plate Scrap	35.00-36.00

## Cast Iron Grades

No. 1 Cupola Cast. ....	38.00-40.00
Heavy Breakable Cast. ....	33.00-35.00
Clean Auto Cast. ....	38.00-40.00

## BUFFALO

No. 1 Heavy Melt. Steel	\$39.00-40.00
No. 2 Heavy Melt. Steel	34.00-35.00
No. 1 Busheling. ....	34.00-35.00
No. 1 Bundles. ....	34.00-35.00
No. 2 Bundles. ....	31.00-32.00
Machine Shop Turnings	27.00-28.00
Mixed Borings, Turnings	27.00-28.00
Cast Iron Borings. ....	27.00-28.00
Short Shovel Turnings. ....	28.00-29.00
Low Phos. ....	39.00-40.00

## Cast Iron Grades

No. 1 Cupola. ....	42.00-43.00
Mixed Cupola. ....	39.00-41.00
Heavy Breakable Cast. ....	38.00-40.00
Malleable. ....	54.00-55.00
Clean Auto Cast. ....	48.00-50.00

## Railroad Scrap

Rails, 3 ft. and under. ....	55.00-55.50
Railroad Specialties. ....	49.00-50.00

## PHILADELPHIA

No. 1 Heavy Melt. Steel	\$39.00
No. 2 Heavy Melt. Steel	34.00-34.50
No. 1 Busheling. ....	34.00-34.50
No. 1 Bundles. ....	39.00
No. 2 Bundles. ....	31.00-32.00
Machine Shop Turnings	30.00
Mixed Borings, Turnings	30.00
Short Shovel Turnings. ....	31.00-32.00
Bar Crop and Plate. ....	41.00-42.00
Punchings & Plate Scrap	41.00-42.00
Cut Structural. ....	41.00-42.00
Elec. Furnace Bundles. ....	41.00-42.00
Heavy Turnings. ....	38.00-39.00
No. 1 Chemical Borings	39.00-40.00

## Cast Iron Grades

No. 1 Cupola Cast. ....	40.00-42.00
No. 1 Machinery Cast. ....	45.00-46.00
Charging Box Cast. ....	40.00
Heavy Breakable Cast. ....	40.00
Unstripped Motor Blocks	37.00-37.50
Clean Auto Cast. ....	42.00
No. 1 Wheels. ....	47.00-48.00

## NEW YORK

(Brokers' buying prices f.o.b.  
shipping point)

No. 1 Heavy Melt. Steel	\$30.00
No. 2 Heavy Melt. Steel	28.00

No. 1 Busheling. ....	28.00
No. 1 Bundles. ....	30.00
No. 2 Bundles. ....	28.00
No. 3 Bundles. ....	26.00
Machine Shop Turnings	22.00-23.00
Mixed Borings, Turnings	22.00-23.00
Short Shovel Turnings. ....	23.00-24.00
Punchings & Plate Scrap	34.00-35.00
Cut Structural. ....	34.00-35.00
Elec. Furnace Bundles. ....	32.00-33.00

## Cast Iron Grades

No. 1 Cupola Cast. ....	38.00
Charging Box Cast. ....	36.00-37.00
Heavy Breakable. ....	36.00
Unstripped Motor Blocks	34.00
Malleable. ....	nom.

## BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	\$25.00-29.00
No. 2 Heavy Melt. Steel	25.00-26.00
No. 1 Bundles. ....	24.00-25.00
No. 1 Busheling. ....	25.00-26.00
Machine Shop Turnings	20.00-21.00
Mixed Borings, Turnings	20.00-21.00
Short Shovel Turnings. ....	21.00-22.00
Bar Crops and Plate. ....	30.00-31.00
Punchings & Plate Scrap	30.00-31.00
Chemical Borings. ....	28.00-29.00

## Cast Iron Grades

No. 1 Cupola Cast. ....	32.00-33.00
Heavy Breakable Cast. ....	31.00-32.00
Stove Plate. ....	30.00-31.00
Unstripped Motor Blocks	28.00-30.00
Clean Auto Cast. ....	29.00-31.00

## CHICAGO

No. 1 Heavy Melt. Steel	\$33.00-35.00
No. 2 Heavy Melt. Steel	30.00-33.00
No. 1 Bundles. ....	33.00-35.00
No. 2 Bundles. ....	28.00-31.00
No. 3 Bundles. ....	26.00-29.00
Machine Shop Turnings	22.00-23.00
Mixed Borings, Turnings	22.00-23.00
Short Shovel Turnings. ....	22.00-23.00
Cast Iron Borings. ....	22.00-23.00
Bar Crops and Plate. ....	36.00-39.00
Punchings. ....	37.00-39.00
Elec. Furnace Bundles. ....	35.00-36.00
Heavy Turnings. ....	31.00-33.00
Cut Structural. ....	37.00-38.00

## Cast Iron Grades\*

No. 1 Cupola Cast. ....	40.00-43.00
Clean Auto Cast. ....	40.00-45.00
No. 1 Wheels. ....	41.00-42.00

## Railroad Scrap

No. 1 R.R. Heavy Melt.	36.00
Malleable. ....	40.00*
Rails, Random Lengths	45.00-46.50
Rails, 3 ft. and under. ....	41.50
Rails, 18 in. and under	45.00
Railroad Specialties. ....	41.00-42.00
Angles, Splice Bars. ....	43.00-44.00

\* Nominal.

## ST. LOUIS

No. 1 Heavy Melt. Steel	\$30.00-31.00
No. 2 Heavy Melt. Steel	29.00-30.00
Machine Shop Turnings	22.00-23.00
Short Shovel Turnings. ....	22.00-23.00

## Cast Iron Grades

No. 1 Cupola Cast. ....	35.00-38.00
Charging Box Cast. ....	32.00-33.00
Heavy Breakable Cast. ....	28.00-30.00
Brake Shoes. ....	31.00-32.00
Clean Auto Cast. ....	36.00-38.00
Burnt Cast. ....	25.00-30.00

## Railroad Scrap

R.R. Malleable. ....	35.00-38.00
Rails, Random Lengths	40.00-45.00
Rails, Random Lengths	34.00-37.00
Rails, 3 ft. and under. ....	37.00-39.00
Uncut Tires. ....	40.00-41.00
Angles, Splice Bars. ....	37.00-39.00

## BIRMINGHAM

No. 1 Heavy Melt. Steel	\$33.00
No. 2 Heavy Melt. Steel	33.00
No. 1 Busheling. ....	32.00-33.00
No. 2 Bundles. ....	30.00-31.00
Long Turnings. ....	25.00
Short Shovel Turnings. ....	27.00
Cast Iron Borings. ....	27.50

Bar Crops and Plate. ....	38.00
Cut Structural. ....	38.00

## Cast Iron Grades

No. 1 Cupola Cast. ....	48.00-50.00*
Stove Plate. ....	42.00-43.00*
No. 1 Wheels. ....	44.00-45.00

## Railroad Scrap

No. 1 R.R. Heavy Melt.	38.00
R.R. Malleable. ....	nom.
Axles, Steel. ....	60.00-62.00
Rails, Random Lengths	52.00-55.00
Rails, Random Lengths	38.00-40.00
Rails, 3 ft. and under. ....	46.00-48.00
Angles and Splice Bars	46.00-48.00

\* Nominal.

## SAN FRANCISCO

No. 1 Heavy Melt. Steel	*\$25.00
No. 2 Heavy Melt. Steel	*25.00
No. 1 Busheling. ....	*25.00
Nos. 1 & 2 Bundles. ....	*23.00
No. 3 Bundles. ....	*20.00
Machine Shop Turnings	*15.00
Bar Crops and Plate. ....	*25.00
Cast Steel. ....	*25.00
Alloy Free Turnings. ....	*15.00
Cut Structural. ....	*25.00

## Cast Iron Grades

No. 1 Cupola Cast. ....	43.00
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## Railroad Scrap

No. 1 Heavy Melting. ....	*26.00
Wheels. ....	*29.50
Rails, Random Lengths	*28.50

\*F.o.b. California shipping point.

## SEATTLE

No. 1 Heavy Melt. Steel	\$27.50
No. 2 Heavy Melt. Steel	27.50
No. 1 Busheling. ....	27.50
Nos. 1 & 2 Bundles. ....	27.50
No. 3 Bundles. ....	24.50
Machine Shop Turnings	21.00-22.50
Mixed Borings, Turnings	21.00-22.50
Punchings & Plate Scrap	35.00
Cut Structural. ....	26.00-28.00

## Cast Iron Grades

No. 1 Cupola Cast. ....	35.00
Heavy Breakable Cast. ....	35.00
Stove Plate. ....	30.00
Unstripped Motor Blocks	32.50
Malleable. ....	40.00
Brake Shoes. ....	35.00
Clean Auto Cast. ....	40.00
No. 1 Wheels. ....	37.50-40.00

## Railroad Scrap

No. 1 R.R. Heavy Melt.	28.50
Railroad Malleable. ....	30.00
Rails, Random Lengths	30.00-32.00
Angles and Splice Bars	28.50

## LOS ANGELES

No. 1 Heavy Melt. Steel	\$25.00
No. 2 Heavy Melt. Steel	25.00
Nos. 1 & 2 Bundles. ....	23.00
No. 3 Bundles. ....	20.00
Machine Shop Turnings	15.00
Mixed Borings, Turnings	15.50-16.00
Punchings & Plate Scrap	33.00-36.00

## Cast Iron Grades

No. 1 Cupola Cast. ....	\$30.00-35.00
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## HAMILTON, ONT.

(Ceiling prices, delivered)

Heavy Melt. ....	\$23.00
No. 1 Bundles. ....	23.00
Mechanical Bundles. ....	21.00
Mixed Steel Scrap. ....	19.00
Mixed Borings, Turnings	17.00
Rails, Remelting. ....	23.00
Rails, Remelting. ....	26.00
Bushelings. ....	17.50
Bushelings, new factory, prep'd. ....	21.00
Bushelings, new factory, unprep'd. ....	16.00
Short Steel Turnings. ....	17.00

## Cast Iron Grades\*

No. 1 Cast. ....	48.00
No. 2 Cast. ....	44.00

\* Removed from price control Aug. 9, 1947; quoted on basis of f.o.b. shipping point.





George Washington, as president in 1793, in approving a requisition for a new chain for a frigate, wrote: "Approved as far as it regards the new chain, but is there an entire loss of the old one?"

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889



## Sheets, Strip . . .

Several large sheet users offering excess tonnage from their inventories

Sheet Prices, Page 168

**Boston**—Slowdown in sheet demand centers among some of the largest consumers, several of whom are offering tonnage from inventories. Close to 1500 tons of carbon stock are for sale from range builders' stock. Bonus or ex-quota steel is appearing and is less readily distributed. More consumers are failing to take their first-quarter allocations in full. Nevertheless, relatively no carbon

tonnage, hot or cold-rolled, is being turned back to the mills as not marketable. This cannot be said of lower-grade electrical and stainless sheets. Electro-coated zinc sheets are moving more slowly. Outright cancellations and severe cutbacks are not at a critical level and, in fact, some new buying has developed to offset them, but the trend indicates further adjustments in distribution during the second quarter.

Cold-rolled strip demand has eased, but reaction is not as sharp as in sheets, although converters show a disposition to buy hot-rolled material for processing at the lower level of the quoted price range.

**New York**—While sheet sellers are being confronted with occasional re-

quests from consumers to hold up tonnage, they still are being faced with more business than they can handle. However, the supply situation generally is becoming less stringent and sellers may be able to increase consumer quotas somewhat before June. Various consumers, particularly manufacturers of household equipment and appliances are revamping their programs with a view to developing good marketable products at lower prices, and some, in the course of doing so, are reducing specifications. Recently there have been several requests for deferments on enameling stock, with a result that at least one large producer is considering the proposition of curtailing production and diverting steel to other major grades.

**Pittsburgh**—Sheet producers state cancellations continue at low levels. Production schedules to date have not been adversely affected by occasional hold-up or cancellation of shipments. Definite easing is noted, however, in lower grade silicon sheets for small fractional horsepower motors used primarily in electrical appliances. Demand for transformer grade silicon sheets is well sustained. Indication of the growing belief among metalworking companies of a gradual easing in tight supply situation in sheets is report that some of the larger firms plan to soon terminate agreements involving premium priced purchases of conversion steel tonnages.

**Philadelphia**—Stringency in sheets continues despite an easing in demand in various lines. Requirements for range boilers and drums are sagging sharply, and producers report an increasing number of consumers are deferring allotments. Nevertheless there is an outlet for all tonnage available.

**Cleveland**—One producer of sheets and strip reports customers are asking that shipments be delayed. The increasing caution in purchasing has not yet extended to outright cancellation of orders, since purchasers still wish to protect themselves with a reserve supply. Growing increasingly price and cost conscious, large consumers are veering away from gray market and conversion steel. One fabricator is trying to unload at 7.50c to 9.50c a pound its inventory of hot and cold conversion sheets that cost 12.00c a pound.

**Chicago**—Last week's cold-rolled sheet price reduction by a midwestern mill brought forth little reaction in local steel circles. Price has become more of a reckoning factor with many steel consumers, the demise for all practical purposes of the gray market being an outstanding reflection of this. This development also has affected demand for steel from other premium sources. Cost-plus computations of some products manufactured for a major retail outlet here can no longer include steel at premium prices. A number of manufacturers, who are committed to take semifinished over an extended period, are continuing to take the converted product but are disposing of excess inventory at approximately warehouse prices. This development, possibly more than any other, has pushed premium steel toward a buyers' market. The easier situation in specialty steel continues about un-

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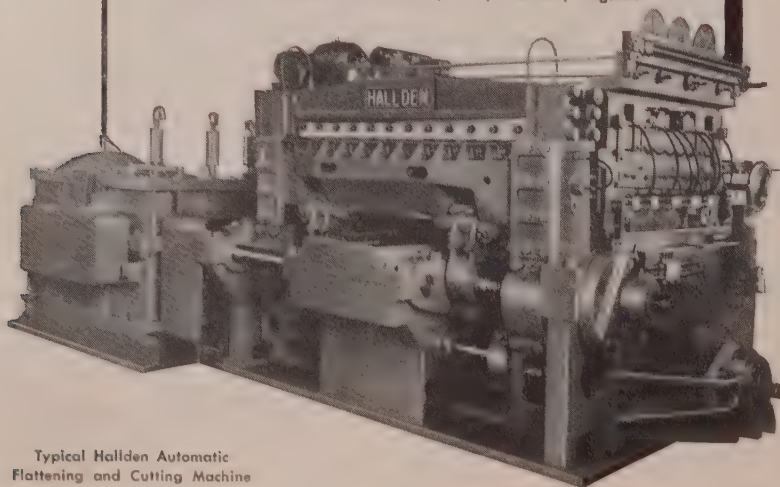
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changed, stainless sheets and some silicon grades being highly competitive.

**Los Angeles**—Although consumers are finding it a little easier to fill their requirements, sheet supplies have not caught up with overall demand. Mill cancellations are promptly absorbed, while fabricators who offer surplus stocks are able in most instances to dispose of the material rapidly, either directly to other users or to warehouses. Surplus supplies of both hot and cold-rolled sheets being made available in this way generally are not bringing substantial premiums, but are being sold at approximately warehouse prices.

**San Francisco**—Despite declining demand from small users, overall scarcity of sheets keeps flat-rolled material in "critical" classification.

## Cuts Premium on Cold-Rolled

**Granite City, Ill.**—Granite City Steel Co. has cut its price for cold-rolled steel sheets \$10 a ton to the basis of \$84 a ton, f.o.b. mill, this city. This action cancels an advance of the same amount made by the company last November and brings its price in line with quotations of competing producers selling in the Mississippi valley area. The lower price also reflects lower material costs which are being passed on to the company's customers.

Hayward Niedringhaus, president, said that some material costs are leveling off and other costs are declining and that it is the plan of the company to pass these reductions on to customers. In this connection, he specifically mentioned pig iron and scrap.

Granite City's price prior to the Mar. 1 cut was about \$10 a ton above the general industry level, the company maintaining a traditional price relationship between 29-gage sheets (a tin mill product) and 28-gage sheets (a sheet mill product). Sheets of the 29-gage classification were boosted last fall with the promise to customers that the hike would be canceled when costs of materials permitted. During recent weeks, the company's scrap costs have dropped about \$12 a ton.

Company's new cold reduction mill meanwhile has reached a 22,000 ton monthly production rate, compared to its practical capacity of 25,000.

which has closed on 1600 tons for a bridge at Warren, Pa., is now asking for bids on erection work.

**Boston**—With more tonnage offered fabricating shops, small-lot contracts are more competitive in this district with delivery frequently the major factor in awarding volume. Several district shops are building up order backlogs moderately, although inquiry lags for this season. Bridge programs are beginning to develop in slightly better volume with estimates to be asked shortly on 2000 tons at Gloucester, Mass. Among new contracts placed is one for 930 tons for an elevated busway, Boston, to Phoenix Bridge Corp., Phoenixville, Pa.

**New York**—While some outstanding private work is in prospect, fabricators look for public work to lend major support to structural activity over coming weeks. Meanwhile, awards are light, with a leading inquiry involving 3000 tons for a state mental hygiene building at Poughkeepsie, N. Y., on which bids are to be opened Mar. 9.

**San Francisco**—Supplies are easier in most lines, although some products produced solely in eastern mills, such as wide flange sections, still are not sufficient to meet all needs. Current slowdown in construction, if continued, is likely to increase inventories of structural materials substantially by summer.

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## Structural Shapes . . .

Structural Shape Prices, Page 169

**Philadelphia** — Structural activity still lags here, with public work contributing mainly to the current demand. This week bids go in on 35,000 tons for the Maryland state bridge over Chesapeake bay and later in the month figures will be received on the Pennsylvania state bridge on Penrose Ave., this city, requiring 16,000 tons. Last week, Booth & Flynn, Pittsburgh, were on the overall contract for building the 6000-ton state bridge at Steelton, Pa., and John McShain, this city, was awarded the general contract for the General Accounting building, Washington, requiring 15,000 tons of shapes and several thousand tons of reinforcing steel. Pennsylvania railroad,

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## Plates . . .

Plate Prices, Page 169

**Boston**—Although substantial tonnage of plate production is under certified allocation, there is some improvement in tonnage available. This development comes sooner than expected due to a lag in the railroad car building program. Car shops are reluctant to take in allocated tonnage in full, considering the slump in new orders since the first of the year. As they take less, more plates are freed for other fabricators. Another factor is the smaller volume of unfilled orders held by mills charging premiums.

**New York**—While gray market plate tonnage is finding little ac-

ceptance and plate producers themselves report an easing in pressure, the latter declare they are still confronted with more business than they can handle. Practically all mills have set up noncertified quotas for the second quarter on about the current basis, although it is possible that as the new period gets well under way they may be able to supply a little more tonnage than now contemplated. There is a possibility that there will be less demand for car tonnage later on which would help the general picture.

**Philadelphia**—General tank work continues to decline and now, for the first time, there is some easing in demand for pressure tanks. Plate producers still report an active over-

all demand, however, and appear little concerned over the outlook for the next few months. Some mills actually will go into the second quarter with heavier backlogs than at the beginning of the current quarter.

**Birmingham**—Demand for plates is heavy as ever. Local mills have received no cancellations and there have been no hold-up thus far reported. Most plate users continue to schedule operations on a basis considerably below actual requirements.

**Los Angeles**—Activity of fabricator engaged in large projects has in no way diminished, and the supply situation in heavy plates here is as stringent as ever. However, demand for light gage plates of  $\frac{3}{8}$ -inch and less has eased somewhat, and suppliers are in a little better position.

**San Francisco**—Stringency in plate supply continues unabated and no let-up in demand is seen. Plates are in the most "critical" supply position because of heavy requirements for pipeline now in progress or planned.

**Seattle**—Inquiry for items involving plates has increased and several sizable contracts are expected to be out for figures soon. Shops have fair backlogs of tank and boiler jobs, the volume of small jobs of less than 100 tons each making a substantial total.

## Wire . . .

Wire Prices, Page 169

**Boston**—Openings in wire mill schedules are sending sales forces scurrying for second quarter volume on more products. Pattern of distribution and consumption in that period will have a new postwar complexion. Consumers of heading wire, notably screw producers, are not taking March quotas in some instances and are doubtful as to how much tonnage they will specify for April. Rods are easing somewhat, one large user working off stocks of rod into finished wire prior to moving from Providence, R. I., to Wilimantic, Conn. At the latter plant, bulk of purchases will be for finished wire. Screw manufacturers' order backlogs are not nearly as far extended and this is showing up in wire buying. Wire mills' backlog, including those for specialties, are also declining.

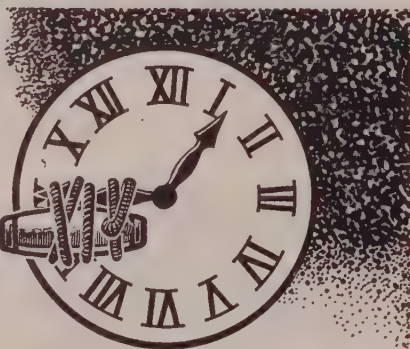
**Birmingham**—Some slackening is noted in wire products from the overall viewpoint. A few scattered wire quotas have been turned down in the past week or 10 days with a resultant easing in fencing and barbed wire. Demand for nails, however, remains consistently heavy.

## Tool Steel . . .

Tool Steel Prices, Page 169

**Pittsburgh**—Tool steel orders continue to lag, although two interests report slight improvement within past ten days. Some producers have been forced to temporarily curtail electric furnace operations 20 to 30 per cent. One interest has dropped the night shift on one furnace previously operating three turns and is operating another furnace only one turn; another producer has dropped the day turn operation to take advantage of cheaper power rates.

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## Reinforcing Bars . . .

Reinforcing Bar Prices, Page 168

**Boston**—Distributors have noted no apparent increase in concrete reinforcing bar quotas. They are still pressed to meet demand which has held up due to favorable weather conditions for construction. Bulk of housing requirements have been placed, but small-lot volume is well maintained, notably for public work.

**Seattle**—Rolling mill backlogs will carry well into the third quarter, present indications promising capacity operations during the year. Delivery schedules are still seriously upset because of transportation difficulties due to the weather. Continued pressure is reported for the placement of small tonnages of reinforcing bars.

one large producer of cold carbon bars has opened books for third quarter, although this interest still has some second quarter capacity available.

**Cleveland**—Cancellations of cold-finished carbon bar tonnage due for February and March delivery have been received with increasing frequency in the last two weeks by one producer. While attempting to reduce their current receipts of this product, consumers show a tendency to protect themselves as to future supply by keeping orders on mill books, although in numerous instances they are paring down the orders. This producer reports warehouses are no longer prospects for cold-finished bar tonnage turned down by other

buyers.

**Chicago**—Second quarter ordering is noticeably cautious, a number of bar customers having expressed a desire to take less steel (in some cases 20 per cent less) than allowable under their quotas, with the proviso that this reduction will not affect third quarter intake. One producer, anticipating a several weeks' carryover on most items, believes the breather will allow him to get current. Alloy bar demand has softened.

**Birmingham**—Bar production holds pretty close to capacity, but the demand is not being met. Concrete reinforcing bars are in especially heavy demand, largely because of road and bridge programs.

## Tin Plate . . .

Tin Plate Prices, Page 169

**Pittsburgh**—Tin plate quotas covering beer cans have been lifted by the Department of Commerce. Demand for beer containers has been far greater than possible to meet under limitations of container order M-81. It is understood, however, that tin plate producers will not be permitted to extend the use of pig tin to meet the expected increase in demand for beer cans beyond their overall tin allocations. In other words, it is expected that consumption of tin plate for other type containers must be reduced if output of beer cans is to be accomplished.

## Steel Bars . . .

Bar Prices, Page 168

**Boston**—More liberal quotas and bonus tonnage on hot-rolled carbon bars are appearing, but most mills continue on allocation. Electric furnace alloy bar buying is off to the extent production is lower with some producers, while open-hearth alloys are slower. Cold-finished stocks are substantial with most industrial consumers and distributors; cutbacks are sharper in cold-finished than in hot-rolled. Users are revising specifications on mill books, taking wanted sizes and grades while canceling delinquent tonnage and sizes which are better represented in their inventories. There has been considerable deterioration in business sentiment in this area and some reduction in steel ingot operating rates is foreseen by some members of the industry before the second quarter is far advanced.

**Philadelphia**—Less pressure is noted for hot carbon bars, particularly in the medium sizes. However, mills are still limiting quotas and for the present at least consumers are finding it difficult to pick up additional tonnage. Some leading consumers are confident that within two or three months supply will be appreciably freer.

**New York**—Some easing in hot carbon bar demand continues resulting mainly in spot openings which can be readily filled. Producers look for high operations throughout the first half, although they may have to draw on backlogs in order to sustain them. Within the past few days



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## Tubular Goods . . .

Tubular Goods Prices, Page 169

**Boston**—Butt weld pipe supply has improved; utilities are less interested in tonnage, while distributor stocks are rounding into better balance. There is no notable easing in seamless with mills heavily committed on that grade. Distributors are moving mechanical tubing in volume available; pressure tubing, notably boiler tubes, is in tight supply. With the eventual distribution of natural gas in New England via Buffalo, a potential large increase in seamless for lead-in connections looms. Some cast pipe will have to be replaced also and this is being anticipated already as indicated by replacement of 3000 feet, 12-in., by a Massachusetts utility. The main line will be of 20, 24 and 26-in. steel pipe.

**Cleveland**—Slackening in demand for merchant pipe is foreseen by producers. With a considerable backlog of old orders for this product, distributors have been taking their mill quotas, but they have reported to producers that new orders are declining. No weakness is apparent in demand for line pipe.

## Semifinished Steel . . .

Semifinished Prices, Page 168

**Pittsburgh**—Output of ingots under conversion deal arrangements has declined substantially, according to leading integrated mills who have in the past taken on substantial tonnage for their customers hard pressed for steel. At least two open hearths producing premium-priced ingots in this district have been down for repairs the past two weeks, and their future operation is uncertain at this time. Decision also is expected momentarily on whether to continue operation of two open hearths at Sterling Steel Foundry Co., Braddock, Pa., for ingot conversion purposes. However, the Hudson Motor Car Co.'s New Castle, Pa., sheet rolling mill operations show no signs of abating; in fact additional employees have been added to the payroll in recent weeks.

Steel Producers Inc., Pittsburgh, has filed petition for corporate reorganization under Chapter 10 of U. S. Bankruptcy Act provisions. About a year ago this company leased space in the Toronto, O., plant of Follansbee Steel Corp. for installation of rolling mill equipment to produce hot-rolled sheets. At time production was suspended, prior to filing reorganization petition, company produced but a relatively small tonnage of sheets.

Entire premium priced steel market has softened considerably in recent weeks. Bessemer furnace ingots are offered for \$65 a ton, against \$95 most of last year; carbon ingots from small steel foundry open-hearth operations or melted in electric furnaces are currently offered at \$80 to \$90 a ton, compared with peak of \$110-\$115. Billets are reported off \$25 a ton from levels late last year, while pipe offerings of around \$215 a ton are reported in contrast to \$275 to \$280 throughout most of last year. Formerly, about \$81 a ton was obtained for piercing only; now a charge

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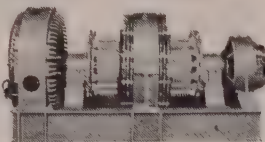
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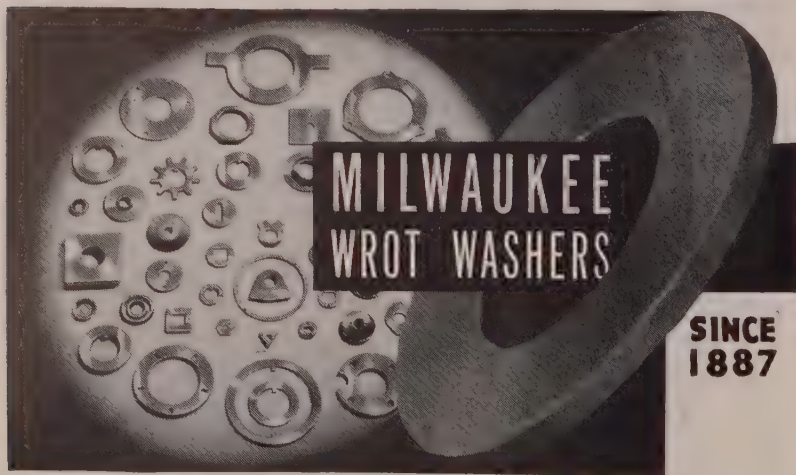


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of \$70 for piercing, threading and coupling is generally made. Cold-rolled sheets are difficult to move at levels in excess of \$150 a ton, particularly for odd sizes; offerings for hot-rolled pickled have been made in recent week at less than \$125 a ton with no takers. Some premium priced sheets also are reported originating from a few metalworking companies who are attempting to unload excess inventories even at a loss in some instances.

## Pig Iron . . .

Pig Iron Prices, Page 170

New York—District foundry melt continues to decline, resulting in less pressing demand for pig iron. Most pig iron sellers claim they are still having no particular difficulty in disposing of all the iron they can produce; nevertheless, they are more interested in developing new business than at any time in recent years. Some producers look for a surplus to develop over the next several weeks unless foundry operations turn upward. So far, however, there has been no shading of prices, except in some scattered instances throughout the country where substantial premiums have been asked. Leading sellers claim they look for no early changes, pointing to the continued slow rise in cost of raw materials.

Buying of iron by some foundries in this district is for replenishment of stock. However, there will have to be a better demand for castings if the present movement of iron is to be fairly sustained. Meanwhile, continued decline in cast scrap prices is still taking some of the edge off the demand for pig iron.

Boston—Costs are being reviewed on which Mystic furnace foundry iron for third quarter will be based; an announcement may be expected soon. Coke and freight rates have advanced; third quarter price will be established on February-March costs. Demand for pig iron has leveled off to current lower melt, but shipments from Everett are heavy enough to prevent any substantial stock reserve which must approach 15,000 tons to allow for a run on basic. The furnace has been producing malleable. While little additional outside iron is available, some increase may be expected under present conditions, especially should any slack develop in automotive consumption or a decline in steel mill operations.

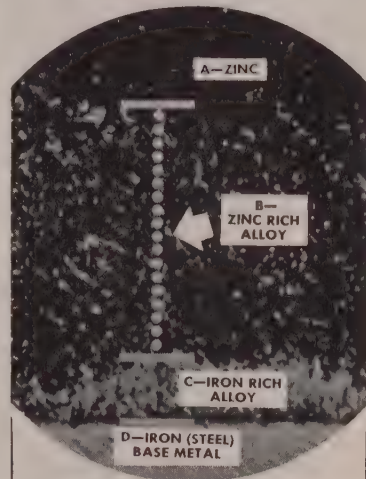
Pittsburgh—Jobbing foundries continue to report slight improvement in new business. However, production schedules generally are restricted to three or four days per week. Pig iron supply is expected to record some improvement over the remaining months this year, notably for the basic iron grade. General easing in tight pig iron situation is reflected in sharp drop in import iron transactions.

Pittsburgh Steel Co. is reported to have made available some basic iron in this district. Additional iron may be offered here this year by interests outside this area.

Philadelphia—While demand for pig iron has declined, there are no indications of early reductions in

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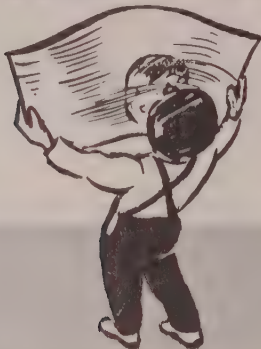
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These results are not exceptions, nor does D. A. Stuart profess to work miracles. It is simply that study plus trial and error on thousands of stainless steel machining jobs has given the company a worthwhile fund of knowledge on the subject. This experience and information is available to anyone interested in getting better finishes, longer tool life or faster production on stainless. For further information write, or call a D. A. Stuart representative.

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prices, except in instances where high premiums have been asked. Some premiums already have been cut.

Recently 7288 tons of basic pig iron from India came in to port here, with the bulk scheduled for a district steel mill and the remainder for some consumers in the Chicago area.

**Buffalo**—With demand for merchant iron less pressing, Tonawanda Iron Corp.'s furnace will be shut down shortly for extensive repairs. The furnace recently was placed back in the merchant iron field, but previously all of the unit's output went to American Radiator, parent concern. A sustained movement of iron is reported from this area to Michigan motor casters. Local producers admit re-entering other market areas for new orders. The foundry situation here holds about steady at recently curtailed levels.

**Chicago**—Many observers now believe that foundry operations have reached their lowest level, several district shops being on a two-day week. However, jobbing shops continue operating six days a week; one such concern in Milwaukee is farming out some of its work to three other shops. Spottiness in this industry appears more pronounced than in any other, but a common level of operations seems in prospect. Several household appliance manufacturers are now starting to come back into the castings and pig iron market. Better conditions in this industry, some think, will become an offset to a predicted slowing down of farm implement and automotive business.

Iron sellers do not have to look for buyers, occasional cancellations being used to partially close the gap between supply and demand of other customers. More pronounced is the easing in foundry coke, although all tonnage offered is taken.

**Cincinnati**—Supply of pig iron, although shipments have increased only slightly, has finally neared demand in this district. The situation is due entirely to a light melt which was not reflected in pig iron ordering until normal stocks were built and the cost of scrap dropped. Many foundries have exhausted the backlogs of castings orders, so that melting schedules are adjusted on a week-to-week basis.

**Wheeling, W. Va.**—Wheeling Steel Co. plans to blow in a 700-ton blast furnace at its Mingo Works around midyear. This is one of three units acquired from Carnegie-Illinois Steel Corp. in 1946, which have been rehabilitated but not enlarged. One 900-ton furnace was placed in service last July and the second furnace, rated at 700 tons, was lighted last fall.

**Birmingham**—Pig iron supply has shown little change over the past few weeks, even though some consuming operations have declined. All available iron is being grabbed up, chiefly by pipe plants.

**St. Louis**—Pig iron demand continues its spotty softening, with occasional cancellations being easily placed with other consumers. The stove industry has slowed even more

in recent weeks, and steel casting continue moderately off. Koppers Co. with furnaces at Granite City, still has customers on allocations and discourages stockpiling as far as possible. Its current output is slightly above 1000 tons daily, of which about 55 per cent is basic iron and 45 per cent foundry. Sellers and consumers foresee at least a mild pickup in demand when the apparent fright liquidation of inventories of foundry products ends and manufacturers their minimum level reached, resume buying. Iron makers generally expect 6 to 12 months of firm business assuming no sharp break in the economy occurs.

Name of the Missouri-Illinois Furnaces Co., of Granite City, this district's principal supplier, was officially changed back to Koppers Co. Inc. last week as a result of the recent court decision upholding sale of its government-owned equipment by WAA.

## Warehouse . . .

Warehouse Prices, Page 171

**Philadelphia**—Jobbers look for better business in March because this month is usually one of the best of the entire year. February business on a daily basis was slightly ahead of January. However, warehouses report an increasing number of lists of surplus stocks from consumers who are endeavoring to reduce inventories. On such general scarce items as are offered, jobbers are availing themselves of this opportunity to round out their own stocks. Some distributors are restricting purchases to lots owned by their own customers. Jobbers are short of small rounds up to 1 1/2-in.; large rounds from 4 in. and larger; and practically all sizes of bar flats.

**Cleveland**—Noticeable slackening in demand for steel from the larger warehouses is causing them to be increasingly conservative in their buying policies. First warehouses to feel the decline were the smaller ones which a month ago reported the conditions now prevalent among the bigger distributors. Demand on warehouses now is almost solely from small consumers. The large consumers, who have been piecing out their steel supplies with higher-priced material from warehouses, are again placing their dependence entirely on mills. The decline in demand is so recent that a balancing in warehouse stocks has not yet resulted, and furthermore, warehouse receipts of mill steel have not increased, even though the steel industry has been producing at capacity for some weeks. The larger warehouses report consumers are being increasingly selective in their purchases, increasingly price-conscious and buying only for immediate delivery.

**Cincinnati**—Announcement of mill quotas for April, which resembled recent volume, dashed hopes of warehouses for an early improvement in shipments. Stocks are badly out of balance. Although pressure for steel is not as insistent as it was during 1948, normal mill customers are still in the market and jobbers find outlets for all available tonnages in



lightest items.

**Birmingham** — Warehouses have little, if any, more steel as a result of a slight softening in demand. Most warehousemen continue to point to what they say is the need for additional steel capacity here.

**Los Angeles** — Warehouse deliveries in February on an average daily basis ran considerably ahead of January, with the increase for most jobbers slightly more than compensating for the shorter month. Inventories at the same time are larger, and customer needs can be met more fully. Nevertheless, stocks remain out of balance, and receipts still are inadequate in sheets, plates, and heavy bars. A little relief is being felt in the case of sheets, however, with warehouses acquiring some surplus material offered by fabricators. Moreover, sheet tonnages which jobbers have been able to place with mills have been increased somewhat for the second quarter.

**San Francisco** — Overall warehouse volume currently is running about one-third under a year ago. Most of the decline in orders has come from small users. Warehouse inventories are beginning to rise, but increase is spotty, leading to unbalanced situation. Many fabricators who are on mill allocation lists are accepting allocated shipments even though their operations have reduced needs for material. As a result, inventories of steel products are piling up in some manufacturing plants. Many of these manufacturers soon may be giving up their allocations.

**Seattle** — Following a marked recession in volume during the last 90 days, jobbing houses are awaiting spring buying which is expected as soon as better weather arrives. Reopening of logging operations and allied lines will stimulate buying for replacements. Some stock items are in better supply, but this condition is attributed to reduced buying in the last three months. There is no improvement in the supply of plates and sheets, although alloys are easier. The price schedule is unchanged.

## Rails, Cars . . .

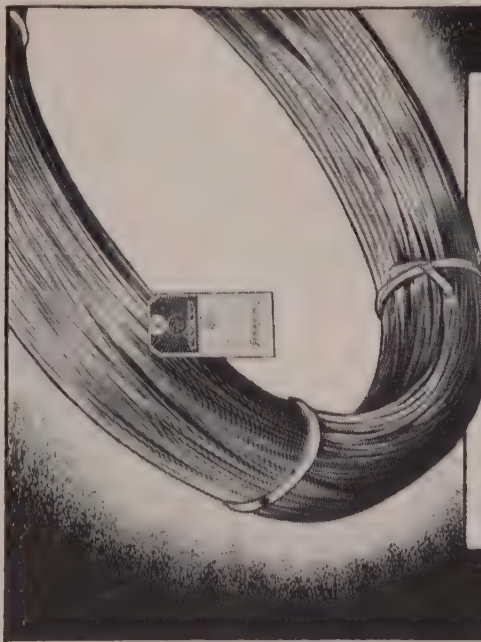
Track Material Prices, Page 169

**Pittsburgh** — Independent carbuilders are expected to complete work on their books by July, unless railroads soon reverse their policy in placing orders for new freight cars. Producers of axles and car wheels, etc., anticipate openings in production schedules starting in June due to same reason. Railroads' yard shops are booked well ahead, although their backlogs represent only about 38 per cent of total cars on order.

## Ferroalloys . . .

Ferroalloy Prices, Page 171

**Philadelphia** — E. J. Lavino Co., this city, advanced their spot price for standard lump ferromanganese from \$160 to \$172, Sheridan, Pa., per gross ton in carload quantities. The new price will become effective on contracts Apr. 1. The increase amounts to 7½ per cent. Quantity, size and packing differentials will continue unchanged.



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## Scrap . . .

Scrap Prices, Page 174

**Pittsburgh**—Market was devoid of new contract purchases for principal grades last week with leading consumers showing little interest in purchases. Good inventory positions and assurance of a steady flow of reciprocity scrap from customers plus unshipped commitments with dealers and brokers has resulted in mills being less concerned that customers return scrap than a year ago. There is some possibility that this practice may be abandoned.

Consideration is also being given to establishment of more realistic price relationship among various scrap classifications. A greater price differential between No. 1 and 2 bundles may result. The small amount of low phos moving in recent weeks has been held to strict specifications for this grade. Turnings and cast scrap grades are under more pressure than other classifications. One mill has made a commitment for short shovel turnings at \$30 for local material and another at \$31 for production plant turnings. Major producer has failed to get No. 1 railroad heavy melting at \$40.

**Boston**—Scrap prices dropped last week with buying slack. Open-hearth grades are down \$2 and No. 1 bundles are selling below heavy melting, but in small tonnages. Trading in cast is near a standstill, and while prices are largely nominal, quotations for most grades are now about half what they were a few weeks back, notably No. 1 cupola and mixed cast. Many foundries are not in position to realize on current declines in cast prices and are well inventoried with tonnage which brought peak prices in the last bulge.

**New York**—Scrap brokers continue to pay \$30 for No. 1 heavy melting steel and \$28 for No. 2 heavy melting steel, No. 1 busheling and No. 2 bundles. No. 1 bundles and No. 3 bundles also are unchanged at \$30 and \$26, respectively. Sentiment in turnings is weak, although prices are nominally unchanged, and low phos grades appear steady. Cast grades also are unchanged. Although there is little new consumer buying, some brokers believe the decline in open-hearth grades is nearing bottom. Unfavorable weather conditions recently have had a somewhat firming influence on prices.

**Philadelphia**—Weakness still prevails in scrap. No. 1 heavy melting steel is now holding at \$39, delivered; No. 2 melting and No. 1 busheling, at \$34-\$34.50. Recently quoted price of \$38 on No. 1 bundles was low and should have been \$39 which still prevails. No. 2 bundles are easier at \$31-\$32; machine shop turnings and mixed borings and turning, \$30; short shovel turnings, \$31-\$32. In the cast grades, charging box and heavy breakable cast are down to \$40; cupola cast is holding generally at \$40-\$42, although one small lot recently sold as low as \$35 under circumstances that were not of market significance.

Buying by steel mills continues light, with no indications of early improvement. Meanwhile, importations remain heavy. The leading eastern consumer has 29 cargoes un-

loading and enroute, representing about 250,000 tons for delivery within 30 days or so. In addition, ships are still coming in for the account of other consumers.

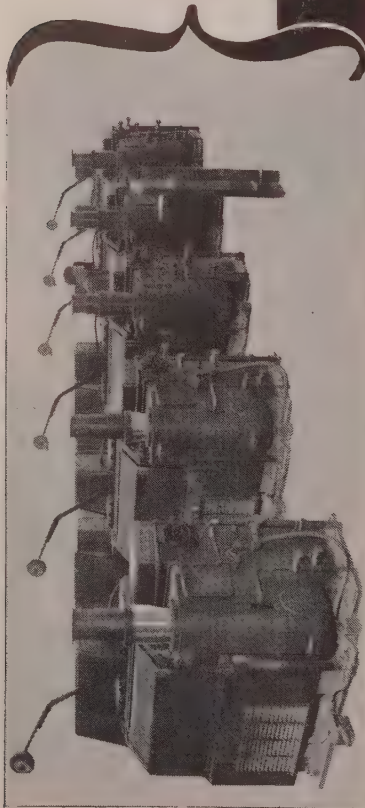
**Cleveland**—Little demand exists for scrap, with a result prices have dropped further on nearly all grades. One broker reported offering No. 1 heavy melting steel at \$36-\$37 but could make no sale. Steel mills are said to be working their scrap inventories down to not more than a 30-day supply. With very little buying on the part of foundries, cast scrap prices have slipped down further, No. 1 cupola now being \$48-\$49.

**Buffalo**—Fresh weakness appeared in the scrap market last week as dealers were unsuccessful in their attempts to obtain additional orders at the prevailing rate of \$34-\$35 for No. 2 heavy melting and related items. In addition, the attitude of leading mill consumers appeared a bit more haughty as the easement in the pig iron market was followed with reports of hot iron melt in open-hearth furnaces running around 75 per cent of capacity. One top mill is using only from 10 to 15 per cent of new scrap in current production.

Easier tendencies also dominated other items. Turnings slipped \$1 to \$2 more, out of line with the usual differentials on heavy melting, when one dealer reported bringing in turnings from Detroit at less than the local market even after freight payments. Weakness in cast reflected the slackness in foundry operations. Prices varied considerably on cast quotes, but it was difficult to find an appreciable tonnage changing hands to establish a firm market.

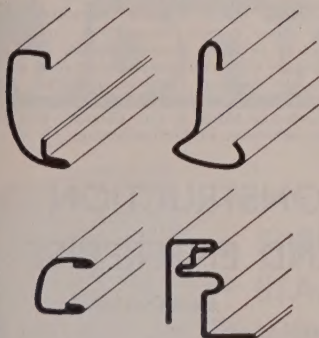
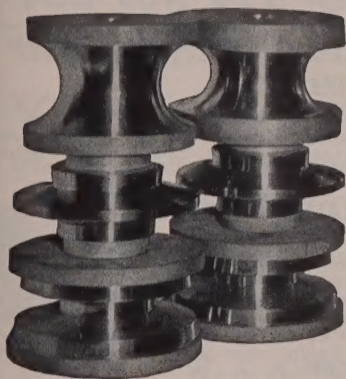
**Detroit**—Prices again hit the skids last week, on the basis of latest mill buying, and all steel grades sagged by \$2 to \$3 per ton. Both open-hearth and electric furnace grades were affected. Dealers reportedly were not in the least surprised, in fact expected buying levels to be even lower. Increasingly larger tonnages of automotive scrap are being offered on the "free" market, indicating outside mills are discarding the practice of "earmarking" production scrap. Fisher Body sold 7700 tons of bundles last week, and Briggs Mfg. Co. was offering 4000 tons for bids. Brokers figure by the end of the month there will be complete abandonment of earmarking by mills. The local mill is continuing to accept such scrap, probably because of the freight advantage over distant mills. Drop in scrap prices figures to about 20 per cent in the past six weeks, although in cast iron grades the decline has been more precipitate, being nearer 40 per cent, and buying is still dried up at the current nominal level of \$40 per ton.

**Chicago**—Relatively small purchase recently by a major district mill of three grades—railroad heavy melting at \$36, dealer heavy melting at \$33, and dealer bundles at \$31—set the market pace for last week and gave slight consolation to traders, prevalent opinion being that this would be the only purchase made by this mill this month. Most other grades are weaker, being quotable \$1 to \$2 under the last figures. There seems to be complete absence of a market for cast grades, foundries apparently limiting their occasional purchases





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to only the tonnage required for particular jobs and making no effort to pile up stocks in anticipation of higher operating levels. One interest last week said three railroads outside of Chicago were unable to sell any of the malleable scrap on their latest lists, and it is understood only one district mill continues to take in allocated material, this being limited to railroad scrap.

**Cincinnati**—Scrap prices have been forced \$2 lower by dullness in the market. There was no confidence among dealers and brokers that the bottom of the slide had been reached. Although the melt for steelmakers is heavy, scrap inventories are large. Foundry buying is off, partly in reflection of slipping demand for castings.

**Birmingham** — Scrap market is completely in the doldrums. There is no change in quoted prices, heavy melting being posted at \$32.50-\$33, but there is a tendency toward further weakness.

**St. Louis**—Scrap prices remain nominal with nearly all of the users still out of the market or holding to small tonnages. However, three purchases of No. 2 melting steel, by two mills, totaling 20,000 tons or two weeks' consumption, have established that grade at a top price of \$30. One user bought a quantity one morning at \$30 and more the same afternoon at \$29. The other mill paid \$30. A dealer reportedly sold some No. 2 bundles at \$27 last week. Although there have been few or no deals, offering prices on other items lately have "solidified" into a pattern averaging possibly \$5 lower than a month ago, but varying widely. For example, No. 1 cupola cast is being offered at \$35-\$38, compared to \$46-\$48 paid a month ago, and re-rolling rails offered at \$45, compared with the \$46-\$48 level of sales earlier.

**Los Angeles**—Quotations for steel-making grades are holding at present levels, but the undertone appears weak. In most instances, recent reductions in price became effective Mar. 1, and there has been a rush of material to buyers in attempts to get under the wire. Mill inventories are better than they have been for many months, and purchases of melting material are on an increasingly selective basis. No. 1 cupola cast is down \$2.50 to a range of \$30-\$35, but foundry demand currently is so slow that quotations are virtually nominal.

**San Francisco** — Prices of steel making grades remain steady at the new level, but weakness continues in foundry grades. Incoming offshore scrap offsets supplies previously derived from ship-scraping operations, and mill inventories are in good condition.

**Seattle** — Selling interests appear to have reconciled themselves to the lowered price of \$27.50 for heavy melting steel scrap and are shipping in volume. Mills report increasing receipts enabling them to replenish inventories. Improved weather has eased transportation difficulties and material is again crossing the mountains from eastern Washington. The grade of scrap has improved as the mills are now in position to reject undesirable lots. Cast iron scrap is quoted at \$35, supplies being sufficient for current foundry operation.

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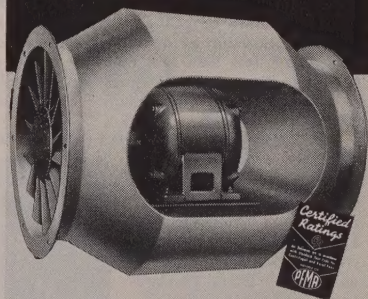
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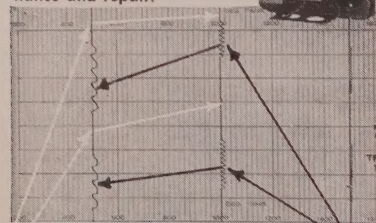
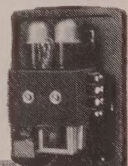
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## Bolts, Nuts . . .

Bolt, Nut, Rivet Prices, Page 171

**Cleveland**—Demand for bolts, nuts and rivets continued to decline here last week. Several cancellations of and cutbacks in orders for fasteners have been reported, due to reduced schedules in consuming plants. However, some of the smaller jobbers increased their orders last week, while the larger interests continued to show little interest pending a reduction in their inventories to levels in keeping with the lower consumption rate. Backlog of orders held by producers now range from two to six weeks.

## STRUCTURAL SHAPES . . .

### STRUCTURAL STEEL PLACED

930 tons, elevated busway lane, Boston Transit department, Boston, to Phoenix Bridge Co., Phoenixville, Pa.; J. A. Singarella Co., Boston, general contractor.

800 tons, army warehouse at Anchorage, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle; Henrik Vallee Co., Seattle, general contract.

550 tons, army warehouse, Whittier, Alaska, to Bethlehem Pacific Coast Steel Corp., Seattle; Henrik Vallee Co., Seattle, general contract.

360 tons, engineering laboratory, Hamilton Watch Co., Lancaster, Pa., to Bethlehem Steel Co.

150 tons, 2-story building, Temple Beth-El, Little Neck, Long Island, N. Y., to Grand Iron Works, New York.

### STRUCTURAL STEEL PENDING

3000 tons, New York state mental hygiene building No. 98, Poughkeepsie, N. Y.; bids Mar. 9.

2000 tons, state highway bridge, Annisquam river, Gloucester, Mass.

1600 tons, galvanized steel transmission towers; Isaacson Iron Works, Seattle, apparently low \$465,409 delivered; American Bridge Co., Pittsburgh, \$426,518 shipping point.

600 tons, Detroit dam, Oregon state; bids in to U. S. Engineer, Portland, Ore.

450 tons, 3-story box factory, Plainfield, N. J.; Alfred M. Korff, architect.

400 tons, Community Memorial Hospital building, Bronxville, N. Y.; bids asked.

375 tons, state bridge, Montgomery county, New York; bids Mar. 9.

200 tons, boiler house, Philadelphia, for state Department of Property and Supplies; bids Mar. 7.

100 tons or more, steel frame forge shop addition to plant of Schmitt Steel Co., Portland, Ore.

Unstated, 381-foot state steel and concrete bridge over Snake river; Brennan & Calhoun, Pocatello, Idaho, low \$101,957 to Idaho highway commission.

Unstated, railway-type hoist car for Fort Peck dam spillway, Montana; awarded to Willamette Iron & Steel Co., Portland, Ore., \$52,500.

Unstated, Army garage and warehouses at Fairbanks and Fort Richardson, Alaska; awards pending, bids in.

## REINFORCING BARS . . .

### REINFORCING BARS PLACED

100 tons, Army warehouse Anchorage, Alaska, to Northwest Steel Rolling Mills Inc., Seattle; Henrik Vallee Co., Seattle, general contract.

### REINFORCING BARS PENDING

2000 tons, Canyon Ferry dam, Montana; new bids Apr. 6 to Bureau of Reclamation, Helena, Mont.

1900 tons, Detroit dam, Oregon state; Consolidated Builders Inc., Oakland, Cal., low

joint bid \$28,230,509.

200 tons, Seattle branch, Federal Reserve Bank, Kuney-Johnson Co., Seattle, apparently low, \$2,058,000.

Unstated, 5-story addition St. Joseph's hospital, Bellingham, Wash.; General Construction Co., Seattle, low \$595,340; John W. Maloney, Seattle, architect.

## PLATES . . .

### PLATES PENDING

Unstated, three welded steel penstocks, accessories and plate outlet conduits, for Canyon Ferry project, Montana; bids to Bureau of Reclamation, Denver, Mar. 24.

Unstated, penstock liner Unit No. 24, Gorge powerhouse project; bids to Seattle, March 16.

Unstated, main supply line water treatment plant; bids to Corvallis, Ore., Mar. 21.

## PIPE . . .

### CAST IRON PIPE PENDING

125 tons, material for Detroit dam cooling system; bids in to U. S. Engineer, Portland, Ore.

## RAILS, CARS . . .

### RAILROAD CARS PLACED

Denver & Rio Grande Western, fifty 50-ton gondola cars, to Bethlehem Steel Co.

Western Fruit Express, 250 forty-ton refrigerator cars, to Pacific Car & Foundry Co., Renton, Wash., these cars were originally scheduled for the company's own shops.

### LOCOMOTIVES PLACED

Chicago & North Western, forty-three 1500-hp diesel freight locomotives, to Electro-Motive Division, General Motors Corp., La Grange, Ill.; five 1500-hp diesel road switchers, to Baldwin Locomotive Works, Eddystone, Pa.; four 1000-hp yard switchers, to Fairbanks Morse & Co., Chicago; two 2000-hp switchers, to Electro-Motive.

# CONSTRUCTION AND ENTERPRISE

## ARKANSAS

FORREST CITY, ARK.—W. B. Coon Shoe Co., 37 Canal St., Rochester, N. Y., plans to build a \$450,000 factory.

## CALIFORNIA

ANTIOCH, CALIF.—Pacific Gas & Electric Co., 245 Market St., San Francisco, has awarded a \$51.5 million contract to Bechtel Corp., 200 Bush St., San Francisco, for construction of a power generation station.

## COLORADO

BOULDER, COLO.—Public Service Co. of Colorado, 15th and Champa Sts., Denver, will spend \$590,000 in a power plant, additions and improvements; and \$121,000 for Boulder sub-station additions and electric distribution system.

## ILLINOIS

BELLEVIEW, ILL.—Illinois Power Co., 135 N. Main St., Decatur, Ill., will build a \$1 million power substation.

NORTHBROOK, ILL.—International Minerals & Chemicals Corp., 20 N. Wacker Dr., Chicago, will build a \$200,000 plant; plans by Herbert Banse, 53 W. Jackson Blvd., Chicago.

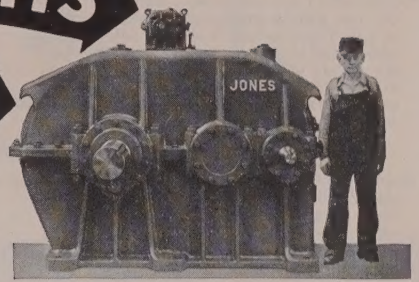
## OHIO

CLEVELAND—General Motors Corp. announces plans for a \$2 million addition to its Cleveland Diesel Engine Division, 7700 Clinton Rd.

NEW RICHMOND, O.—Cincinnati Gas & Electric Co., Fourth and Main Sts., will build a \$6 million power plant; Sargent &

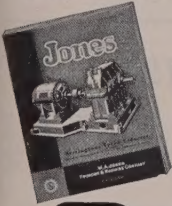


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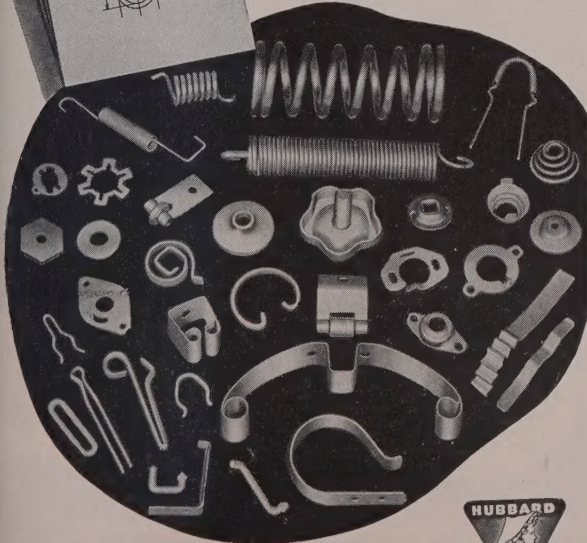
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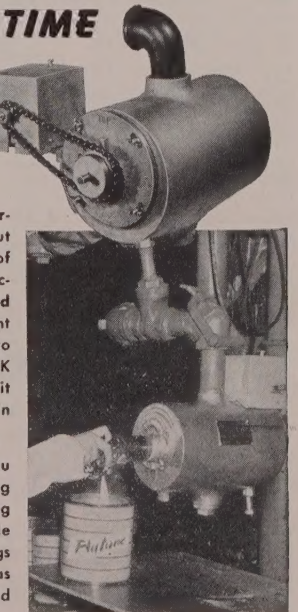
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Lundy, 140 S. Dearborn St., Chicago, consulting engineer; James B. Cook, c/o owner, engineer.

**YOUNGSTOWN**—Youngstown Sheet & Tube Co. has authorized \$2 million improvements to help boost its iron and steel output. This includes \$700,000 to rebuild Buckeye Coal Co.'s coal washer at Nemaacolin, Pa., and \$1.4 million for installation of three new heavy duty cranes at the Indiana Harbor, Ind., open-hearth plant.

## OREGON

**CORVALLIS, OREG.**—R. P. Schindler, city clerk, will receive bids Mr. 21 for proposed water treatment plant.

**CORVALLIS, OREG.**—Zidell Machinery & Equipment Co., 1003 S. W. Front St., plans rebuilding and enlarging plant to permit manufacture of diesel units and industrial equipment.

## PENNSYLVANIA

**CAMP HILL, PA.**—General Foods Corp., 250 Park Ave., New York, will build a \$500,000 warehouse; contract awarded to Austin Co., 16112 Euclid Ave., Cleveland.

**COLLEGEVILLE, PA.**—Superior Tube Co.

will build a \$200,000 factory addition.

**NEWTOWN SQUARE, PA.**—Sun Oil Co., 1608 Walnut St., Philadelphia, will build a research laboratory, refining and processing buildings for \$3 million; plans by Frederick G. Frost Jr., 1400 E. 30th St., New York.

**PHILADELPHIA**—Reading Co., Reading Terminal, will build a \$1 million grain elevator at Port Richmond.

**PHILADELPHIA**—Pennsylvania Railroad, Broad Street Station Bldg., 1617 Pennsylvania Blvd., will build a \$1 million grain elevator at Girard Point.

**PHILADELPHIA**—Gulf Oil Corp., 1515 Locust St., will spend \$1.5 million in building 60 service stations in Philadelphia and vicinity; Rudolph L. Wolff, c/o owner, chief engineer.

## SOUTH CAROLINA

**CHARLESTON**—Atlantic Coast Line Railroad will spend \$500,000 in construction of shops for locomotive and car repair and terminal facilities at Bennett's yards, north of here.

## TEXAS

**DALLAS**—Dallas Power & Light Co., Dallas

Power & Light Bldg., will build a \$7,180,000 plant.

**DALLAS**—Lone Star Gas Co., 1915 Wood St., will build a \$445,945 distribution base, and \$765,000 butane gas dispensing system and meter installations.

**DECATUR, TEX.**—Cities Service Oil Co., c/o A. W. Ambrose, Bartlesville, Okla., will first build a \$750,000 natural gasoline plant; secondly a \$1 million expansion of a casinghead gasoline plant.

**FALFURRIAS, TEX.**—United Carbon Co., c/o J. H. Alexander, Odessa, Tex., will build a \$1 million carbon black plant, and will spend \$175,000 for gas pipe gathering lines for area between Falfurrias and proposed carbon black plant.

**HOUSTON, TEX.**—Missouri Pacific Railway, Missouri Pacific Bldg., St. Louis, will build \$700,000 shop and warehouses; contract awarded to Austin Co., M & M Bldg.

## WEST VIRGINIA

**GEORGETOWN, W. VA.**—Hanna Coal Co., Belfont, Va., will build a \$3.5 million coal preparation plant; Allen & Garcia Co., 322 S. Michigan Ave., Chicago, consulting engineer.

# PRICES OF LEADING FERROALLOYS PRODUCTS

(Continued from Page 171)

## SILICON ALLOYS

**25-30% Ferrosilicon:** Contract, carload, lump, bulk, 18.5c per lb of contained Si; packed 19.90c; ton lots 21.00c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

**50% Ferrosilicon:** Contract, carload lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered. Spot, add 0.45c.

**Low-Aluminum 50% Ferrosilicon:** (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

**75% Ferrosilicon:** Contract, carload, lump, bulk, 13.5c per lb of contained Si, carload packed 14.8c, ton lot 15.95c, less ton 17.2c. Delivered. Spot, add 0.8c.

**80-90% Ferrosilicon:** Contract, carload, lump, bulk, 14.65-15c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

**Low-Aluminum 85% Ferrosilicon:** (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

**90-95% Ferrosilicon:** Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

**Low-Aluminum 90-95% Ferrosilicon:** (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

**Silicon Metal:** (Min. 97% Si and 1% max. Fe.). C.I., lump, bulk, regular 19.0c per lb of Si c.i. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

**Alsilfer:** (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 8.90c per lb of alloy, ton lots packed 10.3c, 200 to 1999 lb 10.65c, smaller lots 11.15c. Delivered. Spot up 0.5c.

## BRIQUETTED ALLOYS

**Chromium Briquets:** (Weighing approx. 3% lb each and containing exactly 2 lb of Cr.). Contract, carload, bulk, 12.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

**Ferromanganese Briquets:** (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk, 10.00c per lb of briquet, c.i. packaged 10.8c, ton lot 11.6c, less ton 12.5c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

**Silicomanganese Briquets:** (Weighing approx. 3 1/2 lb and containing exactly 2 lb of Mn and approx. 1/2 lb of Si). Contract, c.i. bulk 10.0c, per lb of briquet, c.i. packed 10.8c, ton lot 11.6c, less ton 12.5c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

**Silicon Briquets:** (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet, c.i. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2 1/2 lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.i. packed 7.10c, ton lots 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

**Molybde-Oxide Briquets:** (Containing 2 1/2 lb of Mo each) 95.00c per pound of Mo contained. F.o.b. Langeloth, Pa.

## CALCIUM ALLOYS

**Calcium-Manganese-Silicon:** (Ca 16-20%, Mn 14-18%, and Si 53-59%). Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c less ton 22.55c. Delivered. Spot, add 0.25c.

**Calcium-Silicon:** (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot, add 0.25c.

## TITANIUM ALLOYS

**Ferrotitanium, Low-Carbon:** (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lots, 2" x D, \$1.40 per lb of contained Ti; less ton \$1.45. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.). Ton lot \$1.28, less ton \$1.35. F.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot add 5c.

**Ferrotitanium, High-Carbon:** (Ti 15-18%, C 6-8%). Contract, \$160 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis.

**Ferrotitanium, Medium-Carbon:** Ti 17-21%, C 3-4.5%. Contract, \$175 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

## VANADIUM ALLOYS

**Ferrovanadium: Open-Hearth Grade** (Va 35-55%, Si 8-12% max., C 3-3.5% max.). Contract, any quantity, \$2.90 per lb of contained Va. Delivered. Spot, add 10c.

**Crucible-Special Grades** (Va 35-55%, Si 2-3.5% max., C 0.5-1% max.), \$3.

**Primos and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.), \$3.10.

**Vanadium Oxide:** Contract, less carload lots, \$1.20 per lb of contained V<sub>2</sub>O<sub>5</sub>, freight allowed. Spot, add 5c.

**Grainal:** Vanadium Grainal No. 1, 93c; No. 6, 63c; No. 79, 45c, freight allowed.

## TUNGSTEN ALLOYS

**Ferrotungsten:** (W 70-80%). Contract, 10,000 lb W. or more, \$2.25 per lb of contained W; 2,000 lb W to 10,000 lb W, \$2.35; less than 2,000 lb W, \$2.47. Spot, add 2c.

**Tungsten Powder:** (W 98.8% min.). Contract or spot, 1000 lb or more, \$2.90 per lb of contained W; less than 1000 lb W., \$3.

## ZIRCONIUM ALLOYS

**12-15% Zirconium Alloys:** (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract, c.i. lump, bulk 6.6c per lb of alloy, c.i. packed 7.35c, ton lot 8.1c, less ton 8.95c. Delivered. Spot, add 0.25c.

**35-40% Zirconium Alloy:** (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

## BORON ALLOYS

**Ferroboron:** (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more, 1" x D, \$1.20 per lb of alloy. Less than 100 lb \$1.30. Delivered. Spot, add 5c.

**Borasil:** (3 to 4% B, 40 to 45% Si), \$6.25 per lb contained B, f.o.b. Philo, O., freight not exceeding St. Louis rate allowed.

**Bortam:** (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

**Carbortam:** (B 0.90 to 1.15%). Net ton to carload, 8c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

## OTHER FERROALLOYS

**Ferrocolumbium:** (Cb 50-60% Mn 5% max., Si 8% max., C 0.5% max.). Contract, ton lot, 2" x D, \$2.90 per lb of contained Cb, less ton \$2.95. Delivered. Spot, add 25c.

**CMSS Mixes:** (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5.5%). Carload, 12 M x D, carload packed 19.0c per lb of material, ton lot 19.75c, less ton 21.0c. Delivered.

**Sileaz Alloy:** (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Carload packed, 1" x D, 43c per lb of alloy, ton lot 45c, less ton 47c. Delivered.

**SMZ Alloy:** (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, 1/2" x 12 M, 16.5c per lb of alloy, ton lots 17.25c, less ton 18.5. Delivered. Spot, add 0.25c.

**Graphidox No. 4:** (Si 48-52%, Ca 5-7%, Ti 9-11%). C.I. packed, 16.50-17.00c per lb of alloy; ton lots 17.90-18.00c; less ton lots 19.40-19.50c. f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

**V-5 Foundry Alloy:** (Cr 38-42%, Si 17-19%, Mn 8-11%). C.I. packed, 14.25c per lb of alloy; ton lots 15.75c; less ton lots 17.00c. f.o.b., Niagara Falls, N. Y.; freight allowed to St. Louis.

**Simanal:** (Approx. 20% each Si, Mn, Al). Packed, lump, carload 11c, ton lots 11.25c, smaller lots 11.75c per lb alloy; freight not exceeding St. Louis rate allowed.

**Ferrophosphorus** (23-25% based on 24% P content with unitage of \$3 for each 1% of P above or below the base). Gross ton per carload, f.o.b. sellers' works. Mt. Pleasant, or Siglo, Tenn.; \$65 per gross ton.

**Ferromolybdenum:** (55-75%). Per lb, contained Mo, f.o.b. Langeloth and Washington, Pa., furnace, any quantity \$1.10.

**Technical Molybde-Oxide:** Per lb, contained Mo, f.o.b. Langeloth, Pa., packed in bags containing 20 lb of molybdenum, 95.00c.